PRICE $1.00

Construction Methods AND EQUIPMENT

A McGRAW-HILL PUBLICATION

OCTOBER, 1958

ARE YOU READY FOR

WHAT'S AHEAD?

PROSPECTS, PROBLEMS, AND OPPORTUNITIES

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PLAN '59

Modernize now for growth and profits

A SPECIAL REPORT FROM McGRAW-HILL TO AMERICA'S BUSINESS EXECUTIVES

A McGraw-Hill survey shows why American business must aim for greater, more efficient production.

Construction Methods explores the climate in which contractors will operate to reach this goal.

Open 'er up!

"POWERSTEEL"®

is more than the match for today's most powerful machines!

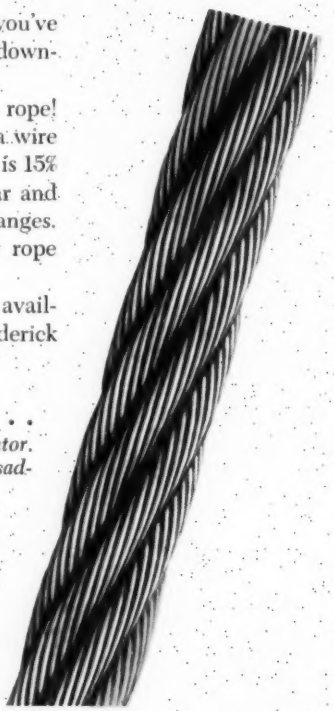
With today's bigger and more powerful construction equipment, you've got to keep it working at full capacity – no babying – minimum down-time – to show a profit.

So don't shortchange today's power with yesterday's wire rope! With "POWERSTEEL" you'll get trouble-free production from a wire rope designed for today's greater horsepower and bigger loads. It is 15% stronger than improved plow steel rope – more resistant to wear and abrasion – gives longer service life – requires fewer rope changes. Many "POWERSTEEL" users report as much as 100% longer rope service in comparison to ropes formerly used!

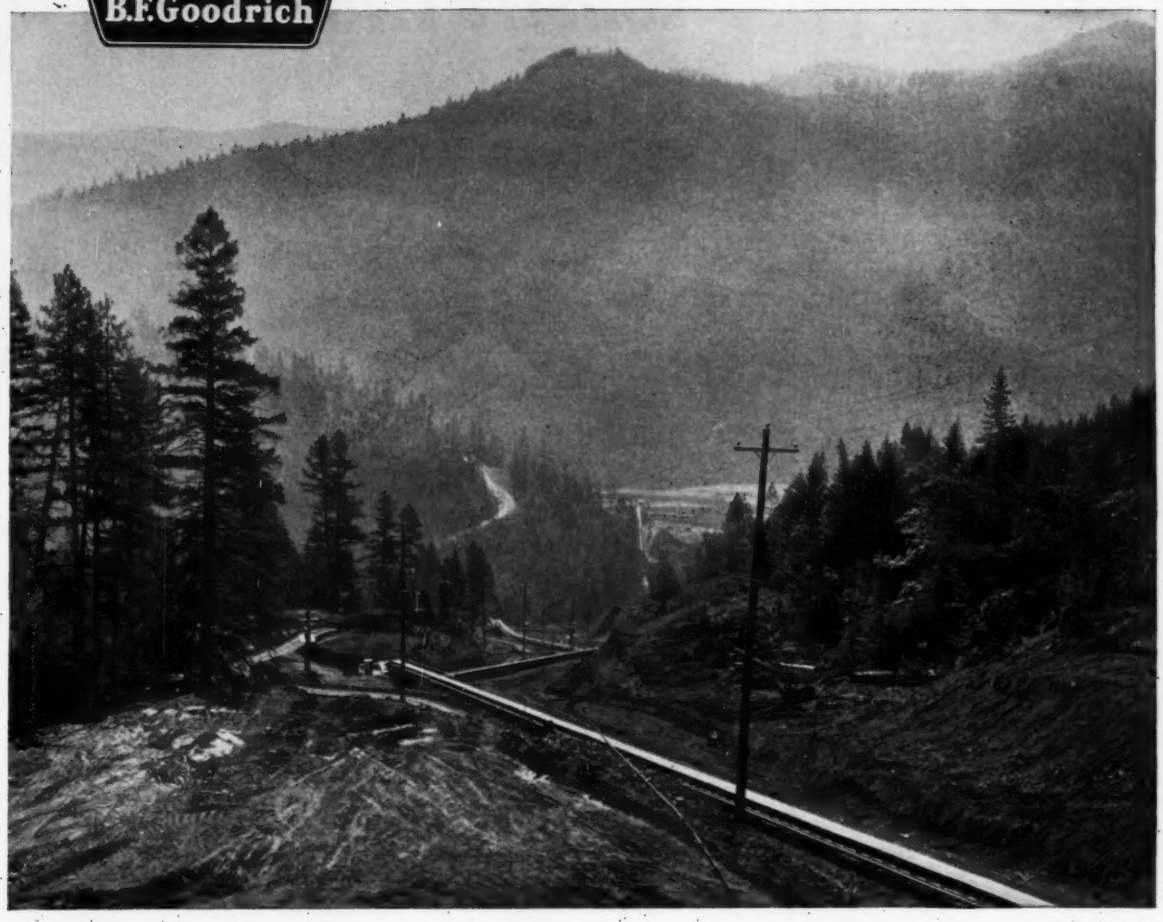
Yellow Strand "POWERSTEEL" is always nearby – always available – at your Broderick & Bascom Distributor. See him soon! Broderick & Bascom Rope Co., 4203 Union Blvd., St. Louis 15, Mo.

NEW! YELLOW STRAND WIRE ROPE CLIPS . . .
Ask for them at your Yellow Strand Wire Rope Distributor. Heavy-duty galvanized steel U-bolt. Drop-forged steel saddle, hot dip galvanized. Easily applied.

Yellow Strand® Wire Rope



B.F.Goodrich



Rubber builds a rock pile to hold back a river

B.F.Goodrich improvements in rubber brought extra savings

Problem: Millions of tons of gravel and clay will be carried two miles down that mountainside to build one of the world's largest earth-fill dams. Because of the heavy loads, only short lengths of ordinary conveyor belts could be used. But every extra transfer point where one belt dumps onto another adds to costs. They needed a belt strong enough to carry this "fill" from mountain top to dam site in just a few long flights.

What was done: Engineers recommended that the gravel and clay be carried by a series of only nine B.F. Goodrich Nyfil conveyor belts—one of them nearly a mile long. In this belt, nylon is used as cross threads in the fabric to give extra flexibility and decrease weight. Belts made with Nyfil fabrics have greater impact resistance, can carry heavier loads farther than belts made with ordinary fabrics. Yet these stronger, longer-lasting belts cost no more.

Savings: On this construction job, the number of transfer points was reduced almost to half by using B.F.Goodrich Nyfil belts. This means big cuts in construction, operation and maintenance costs. Almost 3000 tons per hour are carried by the nine B.F.Goodrich belts.

Where to buy: Your B.F.Goodrich distributor has full information on the conveyor belts described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Department M-458, Akron 18, Ohio.*

B.F.Goodrich *industrial rubber products*

HOW TO HANDLE
WET JOBS

FINISH 4 MONTHS AHEAD, THANKS TO WELLPOINT SYSTEM

Project: Ada Bridge, Ada, Mich.
Contractor: Brown Brothers

ORIGINAL Highway Department plans called for 6 cofferdams—one for each bridge pier. But Brown Brothers devised an alternate method, entailing much less time and money.

• They used a Griffin wellpoint system, in conjunction with a partial L-shaped steel-sheeted enclosure (see photo). Handling 12,000 gals per minute, the system quickly dropped and held ground water level 14 ft below the adjacent river.

• Ready-mix concrete trucks were able to roll across the site and pour concrete directly into the footing forms. Result: the job was finished 4 months ahead of schedule, beating previously anticipated Spring flood problems.

• Before paying high costs on *your* wet work, it will pay you, too, to investigate wellpoints. Call Griffin.

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881 East 141st Street, New York 54, N. Y.
Hammond, Ind. Houston, Tex. Jacksonville, Fla.
West Palm Beach, Fla.
In Canada: Construction Equipment Co., Ltd.
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Construction Methods AND EQUIPMENT

OCTOBER, 1958

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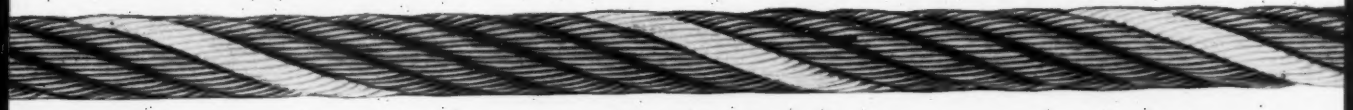

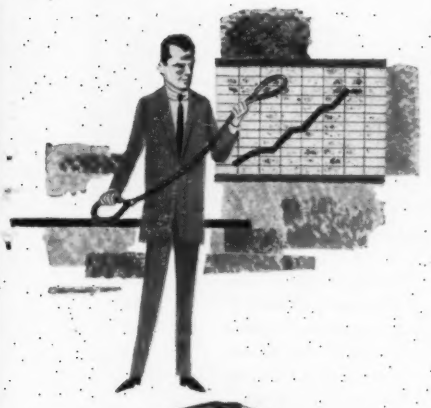

Service Goes Up and Costs Go Down—

Macwhyte Wire-Rope Products* are industry's finest, most complete line of quality PREformed internally-lubricated Whyte Strand wire ropes, round-braided, flat-braided, and single-part wire-rope slings, Stainless Steel and Monel Metal wire rope, aircraft cable and swaged fittings, and "Safe-Lock" wire-rope assemblies. From this broad product group you can fill all your wire-rope needs with ropes of proved quality.

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Most important of all, we maintain large factory stocks, with complete handling and cutting facilities, as well as Mill Depots in support of distributor stocks, to guarantee you the fastest possible delivery.

Macwhyte's free service to you includes literature and catalogs which show the correct wire rope to use on all types of equipment.

Join the large, growing family of satisfied Whyte Strand wire-rope users — ask to have a Macwhyte representative call.

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2941 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel, Plastic Coated and Nylon Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

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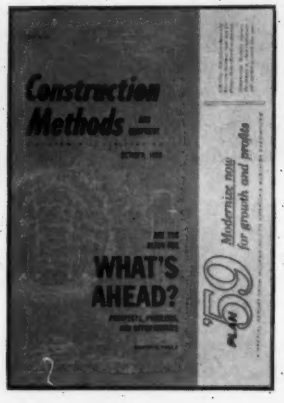
*Sold through distributors for more than 60 years.

Pay Dirt in This Issue

PLAN '59 FOR WHAT'S AHEAD



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NEXT MONTH

A conveyor system two miles long zig zags down a north California mountainside, delivering impervious fill for the Bureau of Reclamation's $46-million Trinity Dam. The conveyor will move an eventual total of 30,000,000 cu yd of fill for the world's highest earthfill dam.

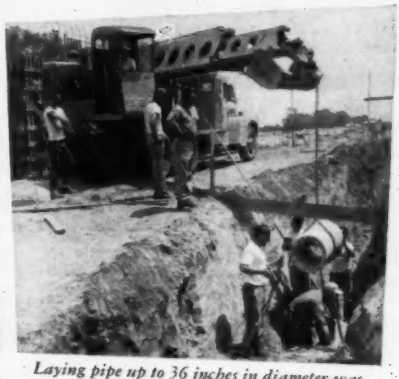
On Massachusetts Turnpike Project...

Gradall averaged 58 hours weekly — from start to finish

Gradall excavated a five-foot deep trench for underground power lines at the rate of 1,000 lineal feet daily; then handled back-filling and finish grading.

An 8-foot blade (one of 25 attachments) does a clean, finished job on fill around bridges.

Gradall quickly and economically handled excavation for bridge footers and other structures on the project.



Laying pipe up to 36 inches in diameter was an easy job when Gradall did the work.

At the project's completion stage, Gradall was kept busy spreading top soil and handling finished clean-up operations.

Using a special curb attachment on the Gradall, they unloaded and positioned over 60,000 lineal feet of granite curbing.

When L. G. Defelice & Son, Inc., of North Haven, Conn., constructed a three-mile stretch of the recently completed Massachusetts Turnpike, Gradall's versatility and arm-action accuracy were utilized on all phases of the job.

Construction of the main roadbed, ten bridges, three box culverts and two traffic interchanges provided many jobs that their Gradall handled in its stride. Why not put this most versatile of all earth-moving machines on your next highway project—and watch both production and profits increase.

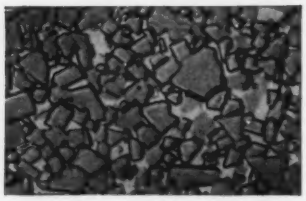
Gradall can cut your costs on all these highway jobs:

- Digging gutter and drainage ditches
- Structure excavations—headwall, stilling basins, etc.
- Trenching for under-drain and large drains
- Placing concrete culvert and drainage pipe
- Backfilling
- Working under bridges and around other structures
- Sloping and grading
- Rip-rapping
- "Hand finish" jobs
- Loading out and spreading top soil
- Pulling concrete forms
- Loading boulders

Gradall®
A Product of
WARNER & SWASEY
CLEVELAND 3, OHIO

MANUFACTURERS OF **Gradall, Hopto** EXCAVATORS AND **Duplex** TRUCKS

Longer bit life— with *new* Sandvik Coromant Bits



Sandvik Coromant Tungsten Carbide (Microphoto) Uniformity of size, even distribution of grain are marked. Free from porosity and impurities —therefore stronger, longer-lived.

Low quality Tungsten Carbide (Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Type	Thread	Available Diameters, in Inches														
		1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	F	x	x														
	113	x															
	H		x	x	x	x											
	115		x	x													
	D					x	x	x	x	x	x	x	x				
	K												x	x	x	x	
BOTTOMING	1" Rope			x	x	x											
	200			x	x	x											
	1¼" Rope					x	x	x	x		x		x				
	400						x		x		x						
	1½" Rope										x	x	x	x	x		
	600										x	x	x	x			
	700												x	x			
	J. 7.5														x	x	
	2" Rope													x	x	x	x

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

SANDVIK COROMANT bits are supplied through Atlas Copco, the world's largest manufacturer of rock drills, who also supply Sandvik Coromant integral steels — the most widely used in the world — and Sandvik Coromant extension steel equipment.

Write or phone today for further details to either of the addresses below:

610 Industrial Avenue
Paramus, New Jersey
COlfax 1-6800

Atlas Copco

930 Brittan Avenue
San Carlos, California
LYtell 1-0375

A ROCK SHOVEL has to be BUILT THAT WAY!

The recognized superiority of Northwest Shovel performance in rock didn't just happen. A *real* Rock Shovel has to be built that way. Northwest Shovels were engineered to handle rock digging at its worst and Northwest advantages in rock mean greater output in easy digging.

The qualities that make Northwest outstanding in any type of digging are easy to check. Start with the model you are interested in from the big 80-D 2½ yd. rig down to the workhorse of the ¾ yd. field, the Model 25.

Booms, rugged and powerful, Sticks of heavy section, the Northwest Dual Crowd—a Crowd that gives you crowding force most other Independent Crowd Shovels waste! This simple crowd with its additional crowding force makes it possible to handle harder digging and more yards per hour—per day—per month!

Other advantages—the Cushion Clutch eliminates shock overloads before they can reach operating machinery—the Feather-Touch Clutch Control assures ease of operation and gives the "feel-of-the-load" free from the complications of compressors, tubing and other delicate mechanisms. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting heavy loads easier—these are just a few of the many features that combine to assure performance in any digging—features that have made Northwest the recognized leader in rock work.

Perhaps Rubber Tired Equipment will do your job better. The Northwest Truck Crane brings you a combination of advantages found in no other similar machine. 25 and 35-ton capacity.

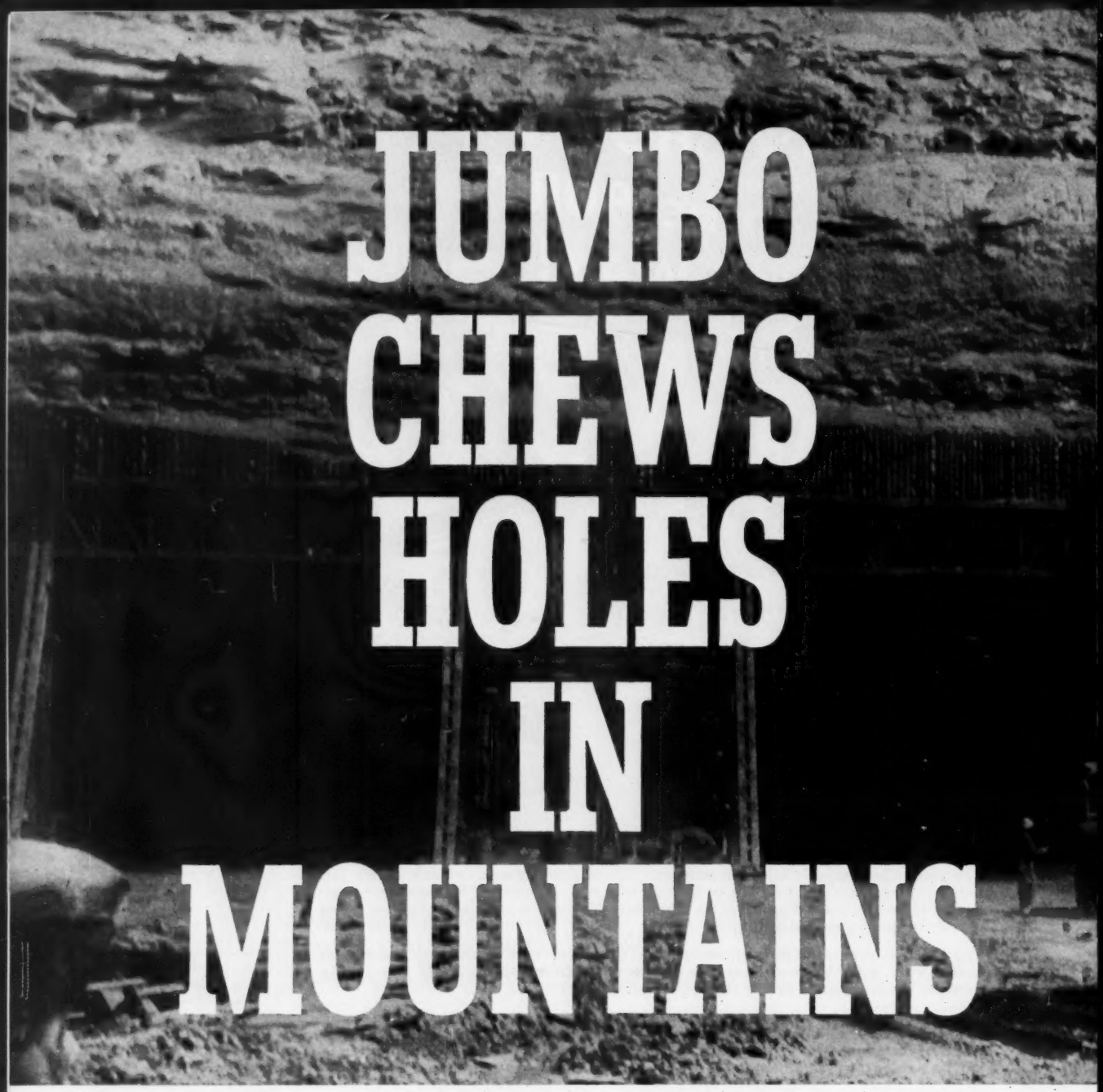
NORTHWEST ENGINEERING COMPANY
1503 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST *Always Ready to* GO

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
⅜ Yd. to 2½ Yd. Capacity	13-Ton to 50-Ton Capacity	⅜ Yd. to 3 Yd. Capacity	⅜ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

S-80-B-1CD



JUMBO CHEWS HOLES IN MOUNTAINS

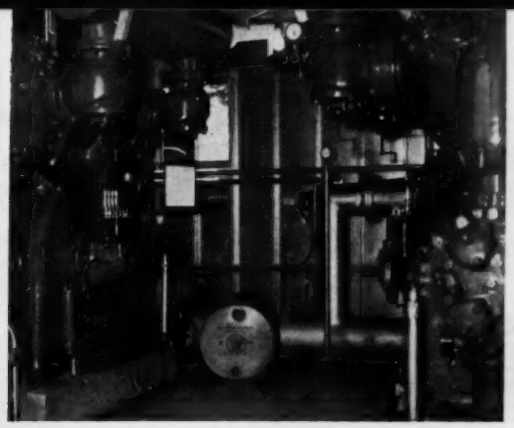
. . . with no unscheduled downtime, thanks to Texaco

This Jumbo drilling rig is Merritt-Chapman & Scott's solution to the Fort Pitt Tunnel Project, Pittsburgh.

Designed and built for the job by M-C&S, the Jumbo stands almost as high as a two-story house, mounts 12 pneumatic hammer drills capable of taking a 10-foot bite of solid rock. This truck-mounted drilling machine was designed to operate alternately in Fort Pitt Tunnel's twin tubes, each running 3,600 feet through solid rock.

This Jumbo is 100% Texaco Lubricated—and it hasn't had one minute of downtime due to lubrication. The reason for this fine performance is the combination of qualities in Texaco Rock Drill Lubricant EP: a highly refined mineral base with extra extreme-pressure and anti-corrosion properties. Texaco Rock Drill Lubricant EP protects against rust and wear even under the most severe conditions of load and moisture.

Texaco protects compressors, too. The two heavy-duty units that drive the Jumbo's drills are reliably protected against rust, sludge and foam by Texaco Regal Oil E R&O. This specially refined and fortified lubricant keeps discharge passages clear, keeps valves working properly and cuts wear to a minimum.



THESE ARE JUMBO'S "MUSCLES"—twin Joy air compressors, lubricated with Texaco Regal Oil E R&O to assure uninterrupted heavy duty performance.

THIS IS M-C&S' JUMBO—a 12-headed mobile drilling machine. Big solutions for big problems are typical of Merritt-Chapman & Scott—the company that built the 34-pier substructure of Michigan's miraculous Mackinac Bridge, longest suspension span in the world.

Proved performance like this has made Texaco the choice for lubrication of the whole Fort Pitt Tunnels Project. To find out how your operation can become more economical and more dependable, call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO REG. T.M. IN ALL 48 STATES

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

NEW·NEW·NEW!
NEW·NEW·NEW!

second in a series

BIG HORSEPOWER LITTLE PACKAGE

VICKERS "high performance" vane pump

• high speed • high pressure • high efficiency • high service life

NEW COMPACT DESIGN . . . much more horsepower than previous pumps of the same package size.

NEW VANE CONSTRUCTION . . . positive vane tracking at all speeds assures efficient operation at increased speeds and pressures.

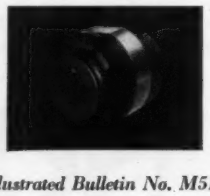
NEW SIZES not previously available . . . answers mobile equipment designers' need for greater hydraulic horsepower in limited space.

NEW PARTS INTERCHANGEABILITY . . . many common parts for single and double pumps (two pumps on the same shaft in one envelope). Lessens inventory requirements.

NEW 4-BOLT SAE FLANGE CONNECTIONS . . . will also accommodate user's 2-bolt flanges of the proper design.

NEW 2-BOLT MOUNTING (SAE 1959 STD.).

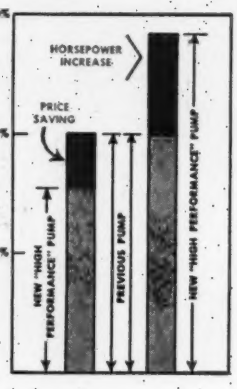
NEW REPLACEABLE PUMPING CARTRIDGE . . . all wearing parts of pump are incorporated in one replaceable cartridge. Easy field replacement without removing pump from its mount. Cartridges available in kit form.



MORE HORSEPOWER PER DOLLAR

The graph at right makes a comparison between the new Series 35 "High Performance" Pump and a previous pump of the same delivery capacity. Note the substantial increase in maximum horsepower...over 40%! This power increase is accompanied by a price saving and by a package size reduction of almost one third!

This is the second unit released in the new complete line of "High Performance" Pumps (both single and double). The first (Series 25) is available in 12, 14, and 17 gpm sizes (at SAE rating of 1200 rpm and 100 psi). The three sizes offered in the new Series 35 pump are 21, 25, and 30 gpm. Characteristics are given in table.



Model Number	Delivery-GPM 1200 RPM 100 PSI	Delivery-GPM 2000 RPM 2000 PSI	Input Horsepower @ 2000 RPM 2000 PSI	Package Size†	Weight
2V21A-**10	20.6	32.1	42.4	L. 6 15/16" W. 5½" H. 6"	50 Lb.
2V25A-**10	24.5	38.0	49.8		
2V30A-**10	29.5	46.8	59.5		

†Exclusive of Shaft Extension and Mounting Lobes

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Write for new illustrated Bulletin No. M5108 for further details and performance characteristics.

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ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

Construction News From Washington

Washington, D.C.
October, 1958

Budget Runs in the Red

Government spending is running $5.3 billion over the initial budget estimate of $73.9 billion for the current fiscal year.

As part of the post-sputnik acceleration in defense planning, there's been a rush to disperse SAC bomber bases and to construct missile and radar early-warning installations.

Housing expenditures are burgeoning. There's a $1 billion hike over initial plans for the Housing and Home Finance Agency, primarily for mortgage purchases under the new special assistance program for low-cost homes.

Civil public works programs have been pushed to step up employment in distressed labor areas. As a result, spending on natural resources programs—navigation, irrigation, flood control, multi-purpose water resource projects, and the like—will total $199 million over the year's original estimate.

Highway construction has been accelerated by increased authorizations in the Highway Act of 1958. This will mean a deficit of $444 million in the Highway Trust Fund and a probable increase in the gasoline tax next year.

New Economy Drive

Now that the recession seems over, though, military construction and other government building programs are once more under the gun of an Administration economy drive.

As a result, you can expect a scaling down of federal construction plans for fiscal 1960, starting next July 1.

Behind the new hold-down on government expenditures is the Administration's intensified push to trim federal spending, sweat down the budget deficit as rapidly as possible, and thus pull the reins on the inflationary threat.

Washington forecasts a $12.2 billion budget deficit for the current fiscal year—a peacetime record. It expects an upturn in corporate tax receipts and other revenues because officials here firmly believe that the recession is over and that a general recovery is under way.

But the key to a future balanced budget still is the Administration's ability to lower, or at least stabilize, expenditures for both military and civil public works projects.

How to Pay for Highways

Rising construction costs and acceleration of the nation's multi-billion dollar highway program have Washington officials eyeing higher user taxes on gasoline, tires, trucks, etc., to pay for the road program.

continued on next page

Costs have climbed 37% over original estimates for the Interstate System alone. This year Congress added another $1.2 billion in additional money to the highway program. This, plus rising material and labor prices, seems sure to inflate the final cost of the road program by $10 billion or more before it is completed 12 years from now.

Indications of higher user taxes came recently when Budget Director Maurice H. Stans said around $1 billion a year more is needed in the Highway Trust Fund if the program is to be kept on schedule. By the end of fiscal 1960, the highway program will have racked up an accumulated deficit of $100 million to $200 million.

Biggest Defense Contractors

Construction contractors figure prominently in the Pentagon's latest listing of major defense contractors. Ten construction firms show up among the 100 companies awarded the most military prime contracts during 1957.

Merritt-Chapman & Scott Corp. is the top construction contractor, ranking 30th in the over-all listing. M-C & S, however, rates so high mainly because of defense business awarded to its shipbuilding and chemical subsidiaries. The corporation's total new defense business last year: $94.8 million.

Other leading construction contractors and their total new military business in 1957: Brown-Raymond-Walsh (joint venture), $62 million; Morrison-Knudsen, $48 million; Oman-Farnsworth-Wright-Kaiser-Morrison-Knudsen (joint venture), $45.8 million.

Also, Peter Kiewitt & Sons, $38.4 million; Greenland Contractors (joint venture), $36.8 million; J. A. Jones Construction Co., $32.9 million; Oman-Farnsworth-Wright (joint venture), $26.4 million; T. C. Bateson Construction Co., $23.5 million; and Pomeroy-Hawaiian-Bechtel (joint venture), $19.8 million.

Capital Spending Turns Up

In the government's latest survey on capital spending, businessmen indicate they are confident that a strong economic upturn is in the making. This was shown by their decisions to step up cash outlays in the fourth quarter for construction of new plants and for expansion of their production facilities.

When a similar survey was taken three months previously, businessmen indicated they intended to keep slashing their capital spending until well into next year.

They changed their minds in the intervening three months, apparently on the basis of the good showing business made toward recovery during the summer months. Their plans now call for fourth quarter spending at an annual rate of $31,020 million—a $700 million jump over the rate in the third quarter.

Capital expenditures are of far greater importance than actual dollar amounts involved. Expenditures here have a multiplying effect, tending to produce greater expansion throughout the whole economy. The drop in capital spending, along with inventory reduction, were major factors in the 1957-58 recession.

Instantaneous
GRAVITY DUMP

Any time quick dumping action is needed, operator releases fast by-pass of fluid in hydraulic cylinders . . . *gravity* takes over . . . dumps load *instantly*. Hydraulic cylinders check body-tilt at 65° angle . . . have same cushioning action when dump body is returned to normal hauling position.

Controlled
GRAVITY DUMP

During a *full-controlled* dump cycle, hydraulic system acts as a retarder. *Gravity* actually tilts the body . . . hydraulic pressure *controls* the rate of discharge, or *holds* the dump body in any desired position . . . *No body-hoist!*

You get both in new 10-YARD Dumptor!

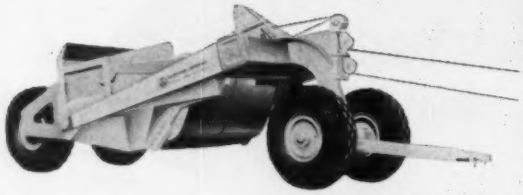
Plus → **PIVOTING SEAT for 2-direction travel**

Operator always faces direction of travel . . . swings around *without leaving seat*. Dual steering wheels, throttle, brake pedals are located at both operating positions of pivoting seat. Directional travel and speed-range lever, and the dump controls are centrally-located for convenient 2-way operation . . . no-turn shuttle hauling.

Big things have happened since you last looked at Dumptors. A new, 10-yard Model 100, with 30,000-pound payload capacity, has been added to the Koehring® line. In addition to its dual dumping advantage, and new two-way controls for no-turn shuttle hauling, you also get: speeds up to 20 m.p.h. in either direction • speed-range selections controlled by easy-acting hydraulic clutches • constant-mesh transmission with smooth torque-converter drive • power steering • 28½% gradability, and many more advantages for low-cost, heavy-duty hauling. A smaller, companion-model 6-yard Dumptor® is also available. Why wait? Call Koehring distributor *today!*

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

K849



MODEL CWT-8

8.0 cu. yds. STRUCK
10.5 cu. yds. HEAPED

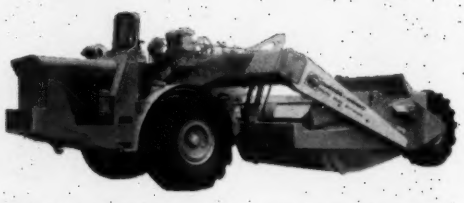
AVAILABLE IN 10.0 and 13.5 CU. YDS.

MODEL CW-27

7.0 cu. yds. STRUCK
10.0 cu. yds. HEAPED

MODEL CWT-15

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED



MODEL CW-215

15.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-214 REAR DUMP UNIT

MODEL CWT-20

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CW-220

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CWT-26

26.0 cu. yds. STRUCK
33.0 cu. yds. HEAPED

MODEL CW-226

26.0 cu. yds. STRUCK
36.0 cu. yds. HEAPED

INTERCHANGEABLE WITH MODEL CWD-221 REAR DUMP UNIT

MODEL CW-320

INTERCHANGEABLE WITH MODEL CWD-321 REAR DUMP UNIT

20.0 cu. yds. STRUCK
27.0 cu. yds. HEAPED

MODEL CWD-321

INTERCHANGEABLE WITH MODEL CW-320 SCRAPER UNIT

21.0 cu. yds. STRUCK
31.0 cu. yds. HEAPED
35-TON LOAD CAPACITY

A SCRAPER FOR EVERY EARTHMOVING JOB . . .

CURTISS-WRIGHT

CONSTRUCTION MACHINERY

Curtiss-Wright Construction Machinery offers the most extensive scraper line in the industry! These rugged, dependable high speed machines — produced at South Bend — incorporate design features that give contractors the versatility and performance that pays off in lower costs-per-yard and bigger profits on any earthmoving job.

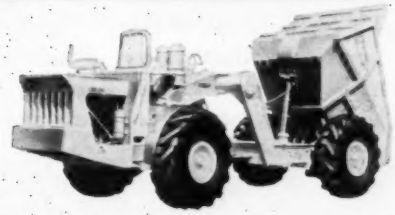
And supporting performance in the field is the nationwide network of Curtiss-Wright distributors with a staff of factory-trained service personnel and extensive parts stocks. Factory parts depots located strategically throughout the country cut downtime on major overhauls too.

For scraper performance that means bigger earth moving profits — see your Curtiss-Wright Construction Machinery distributor today.

SOUTH BEND DIVISION
CURTISS-WRIGHT CORPORATION
SOUTH BEND, INDIANA

MODEL CWT-30

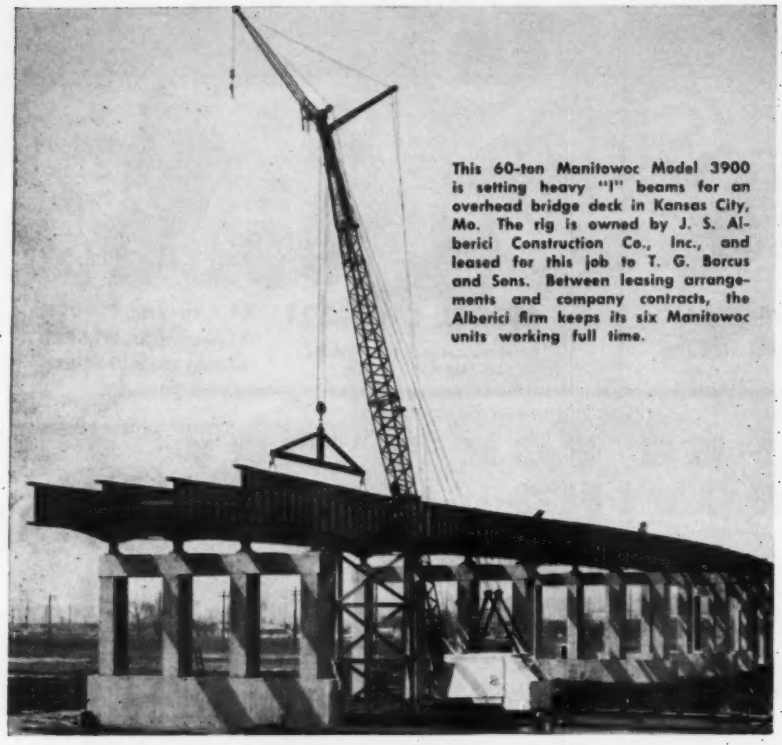
30.0 cu. yds. STRUCK
39.0 cu. yds. HEAPED



MODEL CWD-214

INTERCHANGEABLE WITH MODEL CW-215 SCRAPER UNIT

14.0 cu. yds. STRUCK
21.0 cu. yds. HEAPED
25-TON LOAD CAPACITY



This 60-ton Manitowoc Model 3900 is setting heavy "I" beams for an overhead bridge deck in Kansas City, Mo. The rig is owned by J. S. Alberici Construction Co., Inc., and leased for this job to T. G. Borcus and Sons. Between leasing arrangements and company contracts, the Alberici firm keeps its six Manitowoc units working full time.

"Parts and maintenance average $25 a year," says owner of 6 Manitowocs

High Resale Value . . . Top Rental Demand Are Bonus Features

Since 1918 the J. S. Alberici Construction Co., Inc. of St. Louis has specialized in every type of industrial, commercial and governmental contracts. In addition to a healthy construction business, the company leases several of its rigs a good portion of the year. Currently, the Alberici firm is operating six Manitowoc cranes, including four 25-ton Model 2000's, a 40-ton Model 3000 and one 60-ton Model 3900.

LOW OPERATING COST

"Our first rig, a Model 2000, was purchased over 10 years ago," said Mr. Gabriel Alberici, President. "Since then we have used Manitowoc equipment exclusively. One reason is that for our entire fleet, maintenance and parts replacement costs average less than $150.00 a year, or about $25.00 per unit. This is certainly negligible expense for these rugged, hard working rigs."

HIGH TRADE-IN VALUE

Another important consideration which influenced the company's decision to run a "strictly Manitowoc" fleet is the high trade-in price each of these units carries. "After eight years of continuous operation, we traded in our original crane," Mr. Alberici continued, "and were allowed 50% of its original price toward the purchase of a new Model 3000. We know of no other piece of equipment that holds its value so well, is so low in maintenance, and free of costly upkeep."

EASY TO RENT

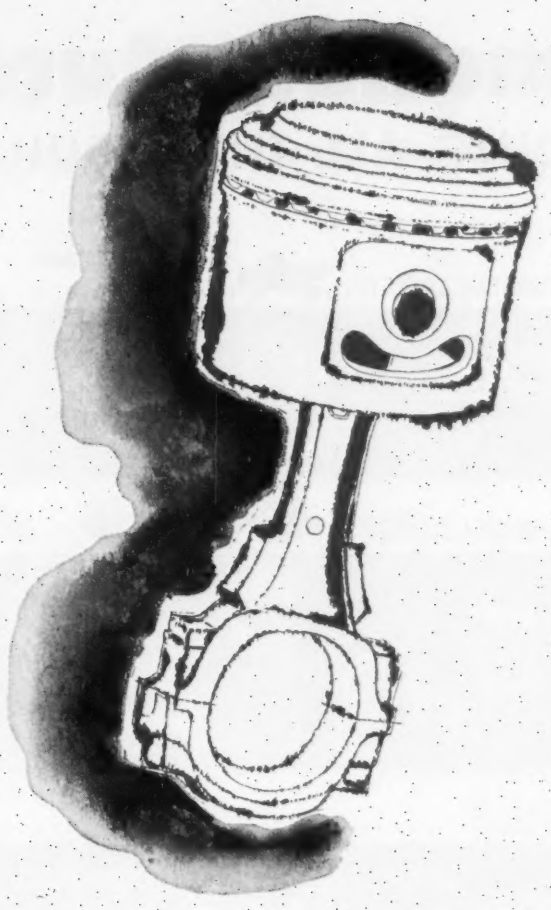
"Best of all, we are able to keep our units working at almost full time even though we do not have that busy a schedule. For example, our new 60-ton rig is a year old and we have been able to rent it for a total of 8½ months . . . using it for our own work the balance of the year. This rental arrangement simply wouldn't work with all makes of equipment. Some cranes, for instance, are impossible to rent. But the Manitowoc name is an *accepted standard* in the field . . . that's why there's always a high demand for our units."

Your helpful distributor can show you why operating a Manitowoc is like "money in the bank" . . . see him soon for full details on any of the eight dividend-paying models in the Manitowoc line!

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
MANITOWOC, WISCONSIN

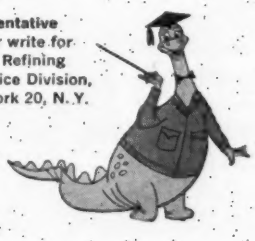
CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.



Pistons... Oil... and How to Save Money

The longer your pistons work before need of ring replacement—the less your cost of operation. Sinclair Tenol® Oils have the reputation for giving longer service to cylinders, rings and other vital parts. Refill with Tenol now. Next time management asks how you've cut costs, tell them you've switched to Sinclair—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.



SINCLAIR
Tenol® Oils

Now 250 manufacturers
—INCLUDING ALL THESE BUILDERS

OFF-HIGHWAY HAULERS AND CRANE CARRIERS

Crane Carrier Corporation — Leaders of the Industry
KW-DART TRUCKS
Cline Custom Built
DUPLEX
KOEHRING HEAVY DUTY
EUCLID
HENDRICKSON Mfg. Co.

DITCHERS, GRADERS, ROLLERS AND STABILIZERS

PETTIBONE
A-M
BarWood Buckeye
LET
BLH
ESTABLISHED GALION 1907
HUBER WARCO
PARSONS
GUNTERT - ZIMMERMAN

PUMPS

Reiner
WORTHINGTON
BERKELEY PUMPS
Barnes
P.I.W.
CORMAN RUPP
CARVER
CARTER
AMERICAN-MARSH PUMPS
PEERLESS PUMP
DEMING PUMPS THE WORLD'S BEST
Marlow PUMPS
MORRIS CENTRIFUGAL PUMPS
DE LAVAL
MORETRENCH

EXCAVATORS, CRANES AND HOISTS

GETTO EFFICIENCE
BAY CITY
SAUERMAN
BALDWIN BLH LIMA HAMILTON
ERCO
BarWood
INSLEY
SILENT HOIST
NORTHWEST
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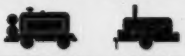
Skagit
"QUICK-WAY"
CLYDE
WASHINGTON IRON WORKS
HECO
MARION
Manitowoc
HANSON QUALITY HCM
Lorain
BUCYRUS ERIE
MICHIGAN
KOEHRING HEAVY DUTY
AMERICAN
UNIT
LIMA
LB
BROWNHOIST

offer "Jimmy" Diesel
OF CONSTRUCTION EQUIPMENT

TRACTORS, SCRAPERS AND LOADERS

LETOURNEAU WESTINGHOUSE · PETTIBONE · CURTISS-WRIGHT SOUTH BEND DIVISION · OLIVER · TROJAN A YALE PRODUCT · EUCLID · EIMCO · MICHIGAN

AIR COMPRESSORS AND WELDERS



GARDNER-DENVER · LINCOLN ARC WELDING EQUIPMENT · JAEGER · LE ROI · JOY · HOBART WELDERS · BLUE BRUTE · POWER VANE · Ingersoll-Rand

CRUSHERS, ASPHALT PLANTS AND PAVERS

Cedarapids Built by IOWA · LEW · ROGERS JOPLIN · AMI · BLAW-KNOX · Pioneer EQUIPMENT · TELSMITH · KOEHRING HEAVY DUTY · LIMA · STANDARD · H&B · BLW · Barber-Greene · CHAIN BELT REX COMPANY · PETTIBONE UNIVERSAL · DIAMOND · GUNTERT & ZIMMERMAN

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GM Diesel engines are available in more than 1800 different applications of power equipment

Contractors generally agree that engine standardization pays big dividends. The wide use of GM Diesel engines in more different makes of equipment than any other Diesel provides unequalled opportunities for standardization—and the fact that GM Diesel covers the range from 30 to 893 H.P. with *only 3 cylinder sizes* results in highest parts interchangeability, lowest maintenance cost. Write for booklet, "STANDARDIZE YOUR POWER"—and learn the reasons why.

DETROIT DIESEL ENGINE DIVISION OF GENERAL MOTORS, Detroit 28, Michigan

In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

GM
GENERAL MOTORS
DIESEL POWER

IT PAYS TO STANDARDIZE ON...

LABYRINTH WATERSTOPS

A SOUND INVESTMENT FOR CONCRETE CONSTRUCTION!

LABYRINTH AVAILABLE IN 2, 3 or 4 rib.

ON YOUR CONSTRUCTION:

1. Consider the investment in design, materials and labor (to mention a few).

2. Then consider how important safe, secure *watertight* concrete joints are.

3. Thorough watertightness *can* be secured by installing Labyrinth Waterstops —a dividend that makes the low initial cost of the product insignificant when compared to your total investment—and one that insures watertight concrete joints for years!

- Corrugated ribs grip concrete, insure an everlasting bond between joints.
- Finest polyvinyl plastic resists chemical action, aging, severe weather.
- Takes just seconds to nail to form . . . easy to cut and splice on location (prefabricated fittings available).
- There's a Water Seal product for every type of concrete work!

If your aim is to stop water seepage, *stop it effectively with Water Seals' Waterstops!*

"See Us in SWEET'S"

New Literature and Free Samples Sent on Request—Use Coupon Below

WATER SEALS, *inc.*

9 SOUTH CLINTON STREET, CHICAGO 6, ILL.

Made in Canada for J. E. Goodman Sales, Ltd. Toronto, Ontario

WATER SEALS, INC. DEPT. 2
9 S. Clinton Street
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Please send free sample and descriptive literature.

Name_____

Company_____

Address_____

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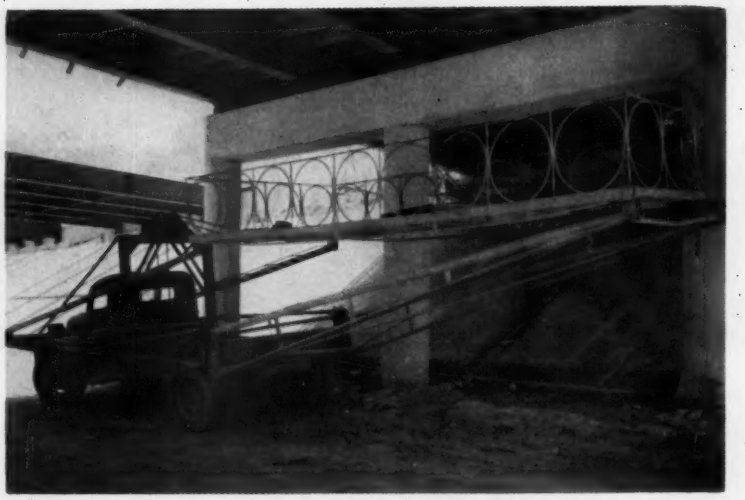
Job Talk...



Truck-Mounted Work Platform

An adjustable platform mounted on the rear of an old Ford truck holds concrete finishers within easy reach of their work on the undersides of highway overpasses. Killian and House Construction Co., of San Antonio, Tex., built the rig for a job on the outskirts of San Antonio that involved many grade separation structures.

Lengths of 2 and 3-in. pipe, hinged to the front and back of the truck, support the platform, which can be raised and lowered to the desired height by means of a winch. The winch lines run over sheaves on the headache frame in back of the cab, then back underneath the platform.

Floor of the platform is a steel gridwork framed by scrap steel strips. A guard railing made out of steel reinforcing bars encloses the platform to protect the workmen.

Fork Lift Delivers the Goods

Contractors in the Wichita, Kans., area get super-service on delivery of concrete blocks. United Cement Products Co. sends a Sherman fork lift truck along with each order. The Sherman rides to the job on a trailer hitched behind the carrier.

The fork lift unloads delivery trucks in a fraction of the time required to do the job by hand. And the operator spots the blocks around the site so they will be close by when masons need them. That means less handling cost.

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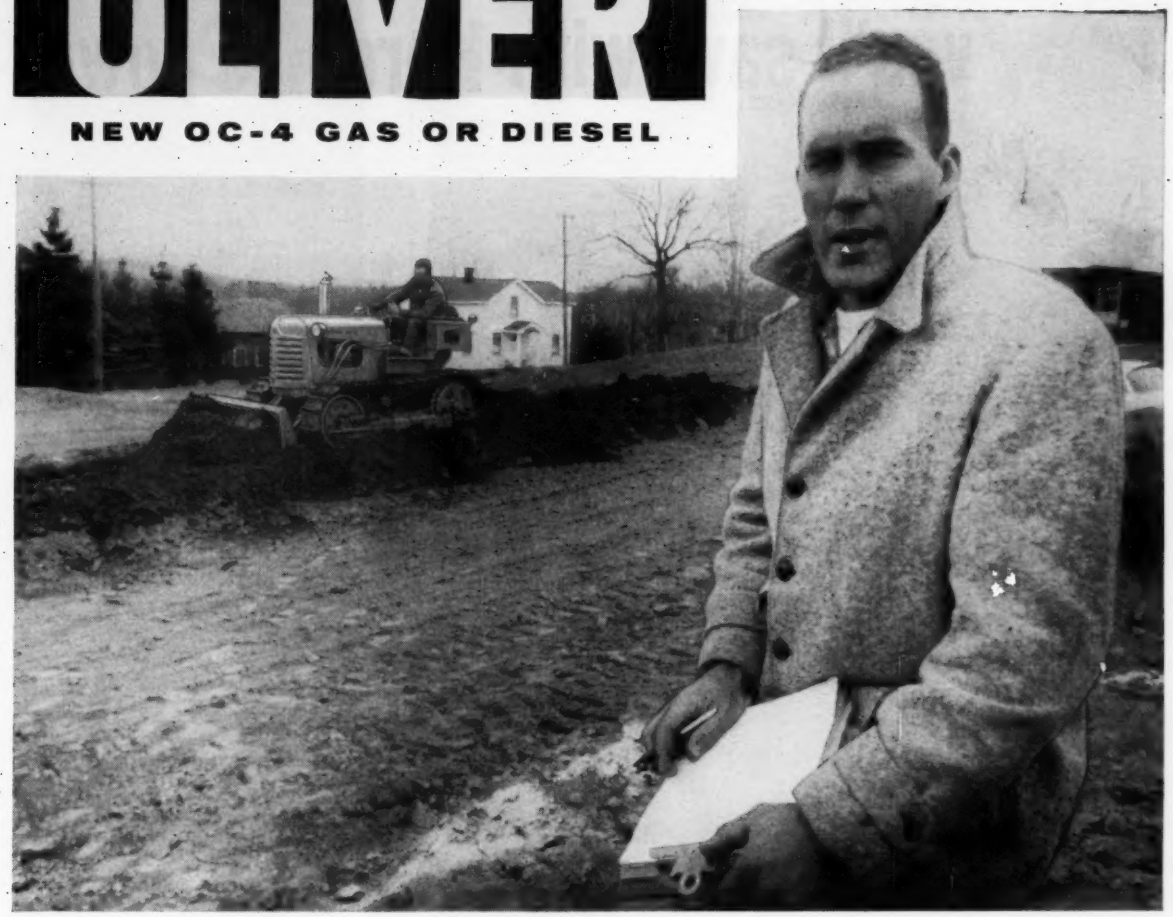
OLIVER

NEW OC-4 GAS OR DIESEL



Pier Kooistra says,

"The new Oliver OC-4 costs only $3 a day to operate* and cuts working time two-thirds!"

Handling a variety of work which includes excavating, paving, landscaping, septic tank installation, etc., Pier Kooistra of Preakness-Wayne, New Jersey, has experience with plenty of tractors. Visited on this job where he is stripping topsoil preparatory to excavating for a basement, he said, "The new OC-4 is just the machine for me. On similar jobs I've hired larger machines with costs of about $40 a day more than I pay to use my own OC-4."

Oliver OC-4—a compact, powerful machine. "Here's the trailer I use to haul the OC-4 from job to job. For a heavier machine it would cost me at least $1000 more for a used truck or $3000 for a new truck—plus everything else that costs more," says Mr. Kooistra. Get the facts about the new OC-4 before you buy.

What's more, he states that the new OC-4 has more traction-maneuvering on soft ground than any other machine he has ever seen or operated.

He concluded, "I'd much rather own five OC-4's than two or three larger machines because I'll make more money with less operating capital." There's a thought worth examining further. Ask your Oliver distributor. He can give you the arithmetic that will save you money.

**Fuel cost, of course.*

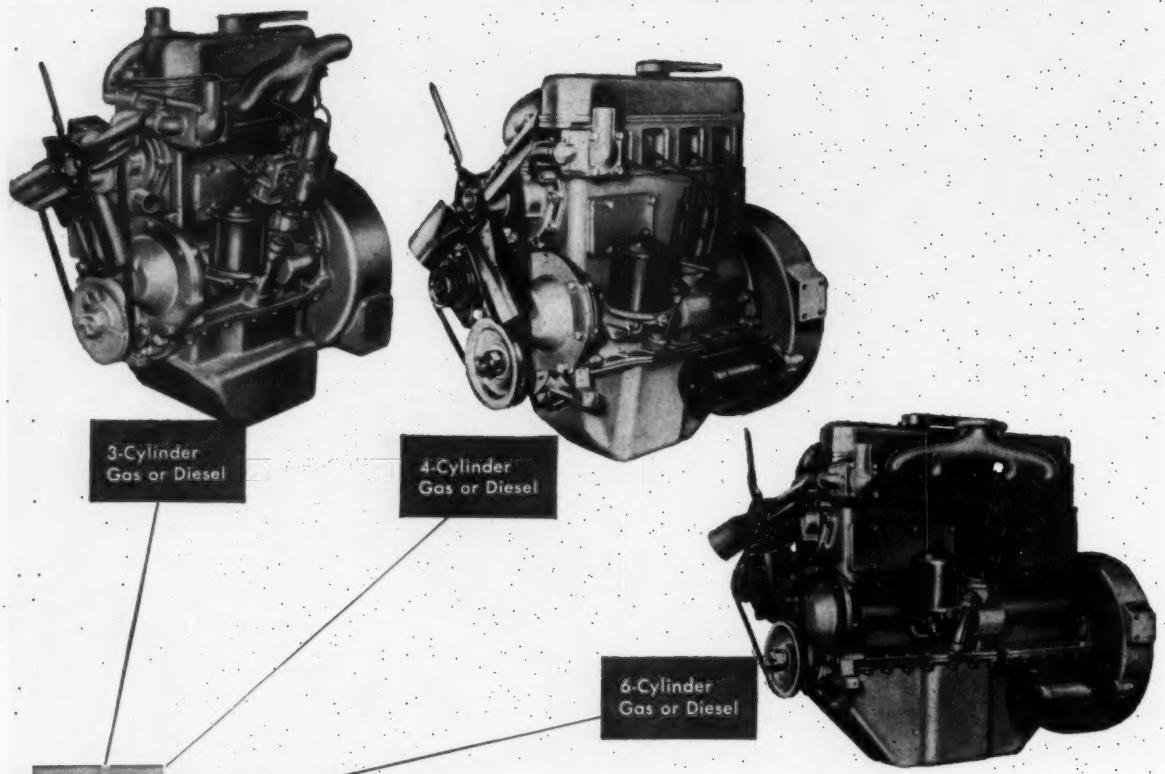
OLIVER

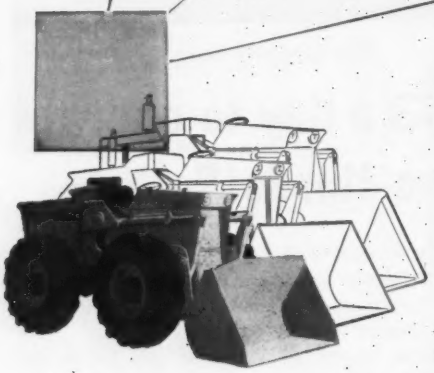
THE OLIVER CORPORATION

Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio

a complete line of industrial wheel and crawler tractors and matched allied equipment

Whatever size loader you buy, you'll save with Hercules power





New DD and GO engines offer maximum parts interchangeability

HERCULES 3, 4, and 6 cylinder GO gasoline and DD diesel engines offer the user maintenance economy never before possible.

For when you specify Hercules power for all your equipment, you can reduce spare parts stock to a minimum. These new DD and GO engines were designed with the highest possible degree of wearing parts interchangeability: one set of spares will service some 18 engines, both gasoline and diesel. Of course, you can leave your engine service to Hercules world-wide distributor network and save even this minimum maintenance inventory expense.

If you'd like a quick visual demonstration of how this parts interchangeability can save you money, ask your nearby Hercules representative for your copy of an illustrated booklet. Or write Hercules Motors Corp., Canton 2, Ohio

HERCULES ENGINES
... Sold and Serviced the World Over

HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

Diver Dunks into Deep Pits

A deep sea diver polished off an unusual chore for contractor Engstrom-Wynn recently when water filled several deep concrete-encased pits under construction at a Universal-Cyclops Steel Corp. strip plant near Coshocton, O. E-W sent the diver to the bottom of the pits to seal them off with a concrete plug.

In sinking the shafts, the contractor dug down 14 ft and cast a 12x25-ft concrete caisson within the hole. Next a clamshell removed the core, causing the shell to sink under its own weight. E-W added three more 12-ft-high sections to the caisson. The pits filled with water to a depth of 20 ft.

E-W placed a steel reinforcing mat at the bottom, then lowered the diver into the water. The diver directed placing of the 48-in.-thick concrete plug poured from a botom dump bucket.

Pumps Beat Seepage

Seepage of underground water threatened to stall cofferdam construction on the $200-million Rock Reach Dam at Wenatchee, Wash., but an army of pumps lo-

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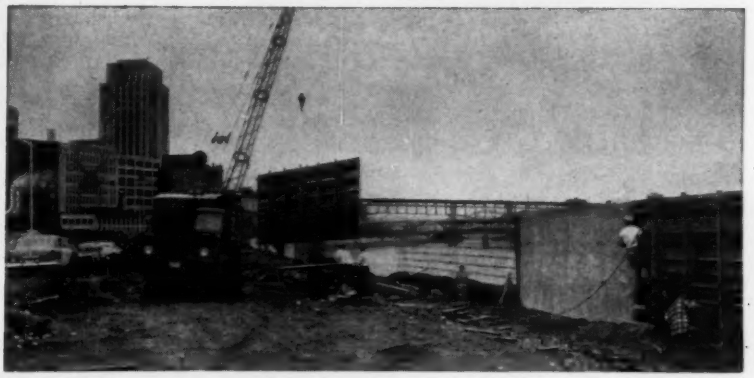
ROAD BUILDING with Symons Forms



Gang Forming . . . Symons wide panel forms made up in section of 10' x 24' and 15' x 24' used to pour 2,400 foot long retaining wall.

Bridge Forming . . . By using Symons high strength forms, contractor was able to reduce pouring time, use fewer men and cut 100 days off bridge forming job.

Culvert Forming . . . A new 9 x 9 inch steel haunch section designed to connect Symons standard wall panels and slab panels for the monolithic pouring of culverts.

Symons can help you with your forming problems. Our engineers will prepare complete form layouts and bill of materials at no obligation. Other Symons products used in road building are bar ties, tie chairs, column clamps and shores. Forms, shores and column clamps may be rented with purchase option—rentals to apply on purchase price. Information on Symons products and services sent FREE on request.

Symons CLAMP AND MFG. CO.

4255 Diversey Avenue Dept. K8 Chicago 39, Illinois

The "VEST POCKET BLACK TOP PLANT ON WHEELS"

AND HOW IT IS HELPING LICK TWO PROBLEMS THAT HAVE BEEN SLOWING UP ROAD REPAIR JOBS

With the H & B Moto-Paver on the job, road crews are no longer "tied to the apron strings" of a stationary blacktop plant. As long as there is a handy source of aggregate, the spreader is ready to work. Normal operation requires only two or three men.

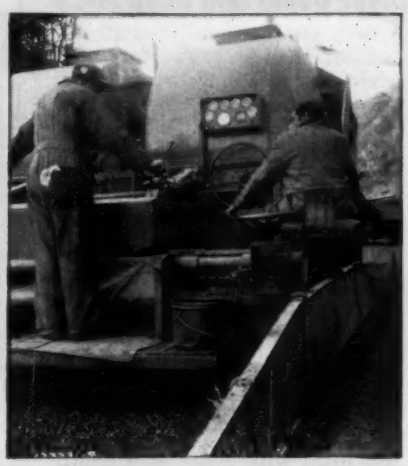
With the Moto-Paver, there is practically no waste. The Moto-Paver mixes only as much material as is required to lay the mat. At the end of a strip, waiting gravel trucks can take their loads back to the pit, or move on to the next job.

● The entire operation—from feed truck to finished pavement—is continuous—and automatic. No matter how wavy and uneven the old surface is, the Moto-Paver puts down a smooth, level course.

The strike-off blade rides on long runners, on either side of the machine. These runners span dips and ruts in the road, so that the blade stays where it is set and the blacktop drops down and fills in the hollows.

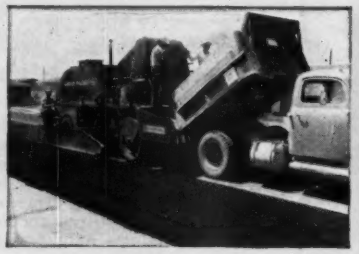
Moto-Paver uses any kind of aggregate and any type of bituminous material. For further information on the Moto-Paver—or H & B batch type asphalt plants, see your nearest H & B distributor or write direct.

HETHERINGTON & BERNER INC. • ***Engineers-Manufacturers***
701-745 Kentucky Avenue, Indianapolis 7, Indiana
Export Dept., 205 W. Wacker Drive, Chicago 6, Ill. . . . Cable Address "PANMAKINA"



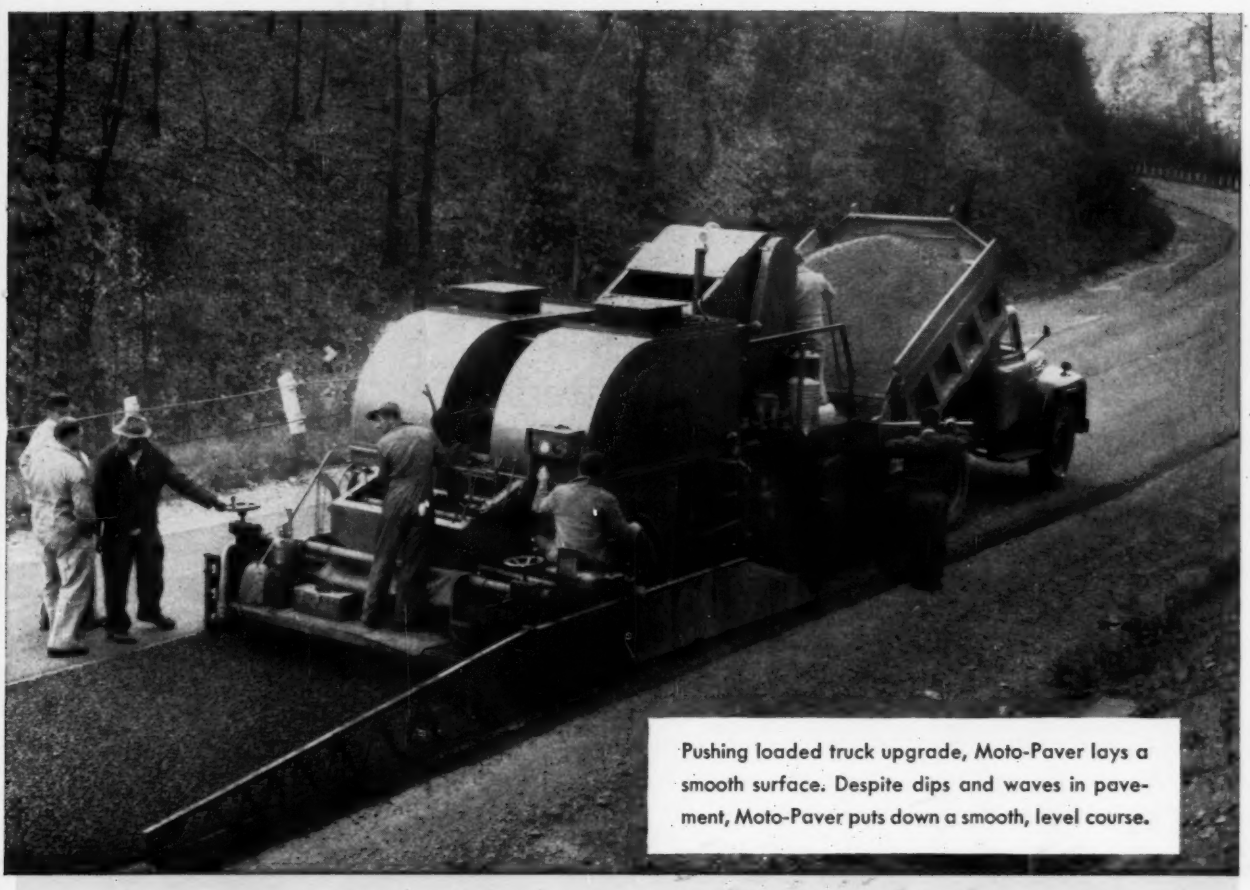
Operator (at right) guides paver along edge of old pavement. Operator in center controls blacktop feed. Paving speed for leveling course is about 2 miles per day. Surface course is laid much faster—up to 2 miles per hour.

Moto-Paver
on Pennsylvania highway job.



Moto-Paver
on Texas sub-division job.

Moto-Paver
on Alps Mountain road, Switzerland.



Pushing loaded truck upgrade, Moto-Paver lays a smooth surface. Despite dips and waves in pavement, Moto-Paver puts down a smooth, level course.

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Moto-Paver
on Central American road job.

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on Washington (State) highway job.

These are tarry deposits removed from crankcase into which permanent-type anti-freeze had leaked.

What some fleet men say is their most serious and repeated engine problem

Permanent-type anti-freeze leakage into crankcase a cause of major maintenance headaches

By A. C. Davis and J. M. Miller, Sales Technical Service Department Standard Oil Company

Both gasoline and diesel engines frequently suffer leakage which permits permanent-type anti-freeze to seep into the crankcase. When this happens, deposits form. Deposits vary from light, varnish-like films to heavy, black, rubber-like tar. The harmful effects of light varnish deposits can range from nil to plugging of rings, sticking of hydraulic lifters and valves and, possibly, sticking of pistons. In severe cases, heavy, black, rubber-like deposits tend to accumulate in the crankcase. Equally serious is the fact that the anti-freeze may remove the additives from the motor oil, causing them to settle out. Deposits resulting from permanent-type anti-freeze leakage are unwanted, and additive removal robs the engine of the full protective qualities of the motor oil and additives.

Identifying problem is difficult

One reason for the seriousness of the leakage problem is that it can go unrecognized until too late. The varnish-like deposits are similar in appearance to those due to lack of motor oil quality or to lack of additive in the motor oil. This is the type most frequently encountered. The deposits, due to heat and chemical action, bear no resemblance to the original anti-freeze and are difficult to analyze.

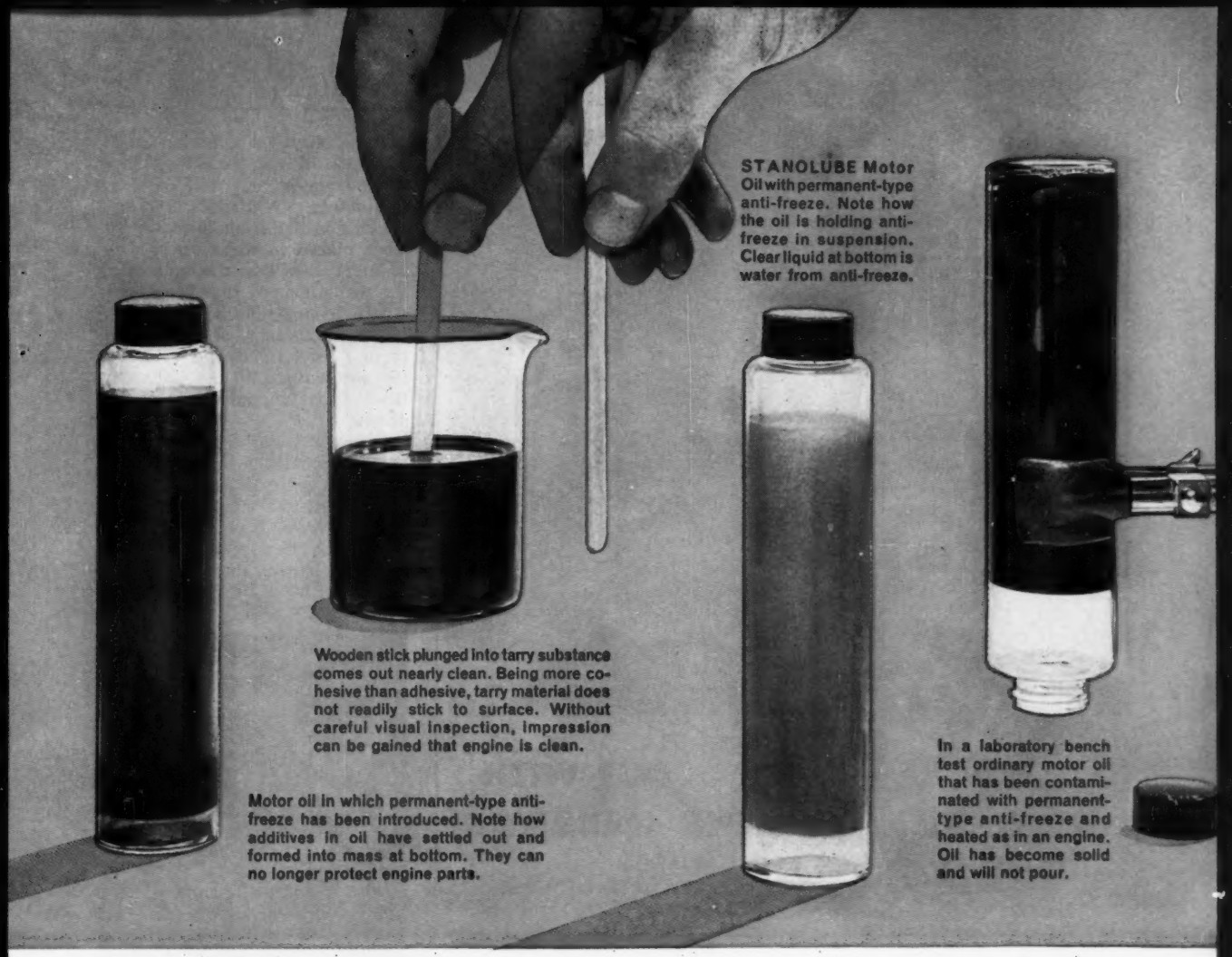
In general, anti-freeze contamination of motor oil goes unrecognized because permanent anti-freeze solutions are insoluble in oil. They settle to the bottom of the crankcase and usually are not included in a used oil sample. Extreme care in sampling is necessary to detect this contamination.

When heavy, tarry deposits occur and motor oil additives are mixed with the deposits, the deposits tend to stay in the crankcase. Frequently, on draining, the oil appears relatively clean—that is, it is less contaminated with carbon, soot and other oil-coloring materials. If such deposits are suspected, they may still be missed by probing because they do not readily adhere to the probe.

These factors can lead a skilled and competent maintenance crew, and an equally capable laboratory analyst, into believing there is no sludge in the crankcase or that there is no oil varnish due to contamination. If the crankcase is removed, however, the damage-causing, tarry-like deposits will be found.

Stop anti-freeze leakage to prevent deposits from occurring

Check head gasket for possible leakage. If leakage is occurring there, gasket should be replaced. In engines using "wet sleeve" type cylinder liners, the sealing rings and lands should be inspected for leakage. Where a synthetic rubber-based sealing compound is used over the sealing rings and lands, replace this coating whenever engine is disassembled.



STANOLUBE Motor Oil with permanent-type anti-freeze. Note how the oil is holding anti-freeze in suspension. Clear liquid at bottom is water from anti-freeze.

Wooden stick plunged into tarry substance comes out nearly clean. Being more cohesive than adhesive, tarry material does not readily stick to surface. Without careful visual inspection, impression can be gained that engine is clean.

Motor oil in which permanent-type anti-freeze has been introduced. Note how additives in oil have settled out and formed into mass at bottom. They can no longer protect engine parts.

In a laboratory bench test ordinary motor oil that has been contaminated with permanent-type anti-freeze and heated as in an engine. Oil has become solid and will not pour.

Anti-freeze affects different motor oils in various ways

The amount and nature of deposits is affected by the amount of anti-freeze leakage and the composition of the motor oil. Severity of operation is also a factor in the amount of deposits formed.

STANOLUBE HD-M and S-1 Motor Oils have demonstrated a unique ability to hold anti-freeze in suspension, minimizing deposits. Most important, the additives in STANOLUBE HD-M and S-1 are not readily removed by the anti-freeze.

Service suggestions

If used oil at drain time appears cleaner than expected, it should make one suspicious of the loss of additive. A mildly opaque oil often signals that water is present, but that additives remain in the oil. We know of no better method of protecting engines in winter than by the use of permanent-type anti-freeze. However, the possibility of leakage and the resulting damage to engine and oil that may occur, are good reasons for removing anti-freeze during warm weather.

More facts

Get more facts about permanent-type anti-freeze contamination and about how STANOLUBE Motor Oils can help solve this problem. Inquire of your Standard Oil automotive lubrication specialist at any of the 48 district offices in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

How to clean an engine contaminated by tarry deposits resulting from permanent-type anti-freeze leakage

1. Drain out all oil and remove oil filter; fill the crankcase with a mixture of about 3 qts. of SAE 10/W and 2 qts. of Butyl Cellosolve (obtainable from chemical suppliers); idle the engine for 30 minutes, noting the oil pressure; immediately drain the solution from the crankcase.
2. Add a flushing solution of about 3 qts. of SAE 10/W and 2 qts. of Kerosene; circulate the mixture at idling speed for 5 minutes; completely drain the system.
3. Install a new oil filter element and add fresh oil of the grade and classification required.

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Rome Disk Plowing Harrows are ideal contractors' machinery for blending in-place materials or soils, for stablizing road shoulders, dam fills or bridge sites. These multi-purpose machines can reduce your equipment investment, cut operating costs, speed up production.

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Your Rome-Caterpillar Dealer will gladly help you select the machine you need for your project. See him soon!

ROME PLOW COMPANY, Cedartown, Georgia

Rome Disk Plowing Harrows

cated at strategic points along the dam site turned back the rising ground water.

Nineteen Wintroath pumps, varying in size from 30 to 300 hp, were placed in wells up to 200-ft deep. Bowls at the bottom of the wells insured that water was drawn from below normal water table. A battery of 12 booster pumps discharged the collected seepage water into the Columbia River some distance below the dam site.

Seepage was so great during the 18 months the pumps were in operation that the automatic cut-off devices with which the pumps are equipped never once were used. The pumps operated continuously during the critical flood months of May, June, and July.

Portable Rig Welds Studs

Battery-powered stud welding equipment saved time in completion of a highway bridge over Outlet Creek near Longvale, Calif., after heavy rains halted progress on the job early last fall.

To keep the county road open during the winter, Moore Dry Dock Co. of Oakland, Calif., erected the two center girders of the composite steel and concrete structure and laid planks across them to serve as a temporary roadway. Stud shear connectors had to be placed and field welded in position when Moore returned to the job this spring.

Moore brought in a 2,000-amp battery pack to power the Nelson heavy duty NS-9 stud welding gun. A small generator recharged the batteries. With this outfit, a two-man crew installed 700 of the ⅞ x 4-in. shear connectors per day.

MODEL SEW

Weighs only 16¼ lbs. (plus

NEW Whiteman

ONE-MAN LIGHTWEIGHT PORTABLE ELECTRIC VIBRATOR

Here is new convenience, new lightweight portability, new efficient performance, new rugged construction in a small one-man electric concrete vibrator. The new Whiteman Model SEW is so light it can be "worn" with handy harness, eliminating the need for long flexible shafts and moving heavy engines around the job. Despite its size, Model SEW produces 10,000 v.p.m. — does a thorough vibrating job. Small 1 5/16" head is perfect for narrow forms, between reinforcing bars and other tight places. Plugs in anywhere. Has a minimum of moving parts for easy maintenance and a long life of dependable service. Call your Whiteman distributor or send coupon for full information.

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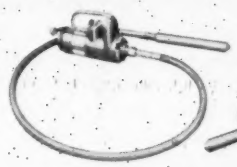
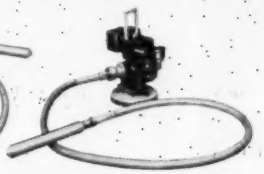
MODEL GW. Heavy-duty machine for big jobs. 6 hp gas engine. 10,000 vpm.



MODEL EW. Powerful electric model for medium and large jobs. 10,000 vpm.



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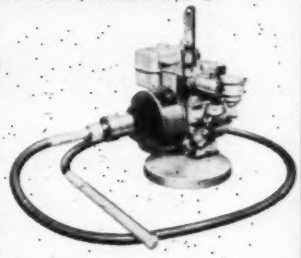
Model SLW is a new, lightweight portable machine for numerous job applications. 3500 rpm gas engine. 10,000 vpm. Between this new machine and new Model SEW, lightweight equipment is now available for every need.



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Good news in the light-duty class! Chevy's longer, stronger '59 line gives you a *dozen* big pickups to choose from . . . new 4-wheel drive models, newly fashioned panels, Step-Vans, and Sedan Deliveries! Scores of innovations include new hard-pulling Positraction rear axle, new bigger brakes, new stronger cabs, new broad-shouldered styling refinements!

Bright new middleweight and heavyweight might! New Series 50H and 60H models with heavy-duty components give G.V.W.'s up to 21,000 lbs. . . . while new Low Cab Forward trucks in Series 50 and 70 make pulling maximum-length trailers easier and more economical than it's ever been before! There are new 5-speed transmissions for extra pulling power; here, too, are huskier, longer lasting clutches; 15,000-lb. rear axle with new durability features—and mammoth 16,000- and 18,000-lb. rear axles.

New thriftier 6's, all-new V8 power! Chevy's best selling 6's are set to pinch pennies like never before with new camshaft design, new valve train durability . . . horsepower and torque to spare! *Six* big V8's match short-stroke power to your job; they're even tougher built and more reliable for '59, with high horsepower ratings that range from 160 to 230. And an *all-new* V8—the 185-h.p. Workmaster Special* is available in Series 70 and 80 models.

See the bright new trucks of Task-Force 59 at your Chevrolet dealer's now! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

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How three Eastern drillers

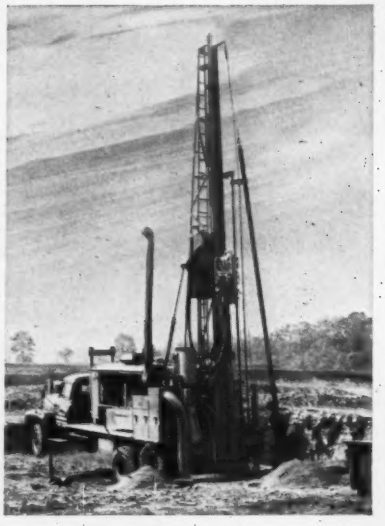
PARLAYED 3 DRILLMASTERS INTO 18

with big profits from the I-R DOWNHOLE drill

These three case histories tell a story that is vitally important to anyone engaged in blast hole or water well drilling. If you want to improve your profit picture in a growth business, it will pay you to look into the many exclusive advantages of the I-R Drillmaster and DOWNHOLE drill. Ask your Ingersoll-Rand representative for complete information, or send today for a copy of Bulletin 4179.

Sullivan Trail Coal Co.
West Pittston, Pa.

To speed coal stripping operations at a number of separate mining properties, Sullivan Trail purchased its first I-R Drillmaster on June 7, 1955. This was a TRUCM rig, mounted on a 6-wheel highway truck and equipped with the revolutionary I-R DOWNHOLE drill. The speed with which this unit penetrated the hard and broken rock overlaying the coal strata made an immediate "hit"—and its ability to quickly change over to straight rotary drilling for the shales and less abrasive formations made it even more desirable. The investment proved so profitable that *two more* TRUCM units were purchased on Feb. 3, 1956—and still *another*, on Nov. 2, 1956! This fleet of four rugged and highly mobile units proved the ideal solution to all jobs where frequent over-the-road movements were required. And for the large stripping operations, where one drill could be kept on the job most of the time, *two* crawler-mounted DM-3 Drillmasters were added on Aug. 8, 1957. All *six* of these heavy-duty blast hole drilling rigs are equipped with I-R DOWNHOLE drills and long-lasting Carset Bits—an unbeatable combination for lower cost per foot of hole.



C. S. Garber and Sons
Boyertown, Pa.

This contract driller purchased his first TRUCM Drillmaster unit on Jan. 25, 1955—primarily for blast-hole drilling on quarry jobs where fast moves were required from one quarry to another. Equipped with the I-R DOWNHOLE drill, it set entirely new standards of performance and costs. Then they tried it on a *water well job*—with such phenomenal success that *another* TRUCM unit was ordered on March 23—and *two more* on June 7 of the same year! The profit potential of these machines for water well drilling soon made this a major use of the DOWNHOLE drill, and business boomed to the point that *two additional* TRUCM units were added to the Drillmaster fleet—in April and July of 1957. Today, these six I-R Drillmasters, with I-R DOWNHOLE drills, are meeting all requirements for a greatly increased business in both quarry and water well work—an increased work load for which the machines are largely responsible. The ruggedness and roadability of the TRUCM mounting makes it ideal for contract drilling where you're here one day—and miles away the next.

New Jersey Drilling Co.
Madison, N. J.

Today, this company is one of the largest and most successful contract drillers in the State—operating a fleet of *six* I-R Drillmasters for both quarry and water well work. This "success story" really began only a little over three years ago. On May 25, 1955, to be exact—the date on which they purchased their first DM-2 crawler-mounted Drillmaster with I-R DOWNHOLE drill. Here, too, it was used initially for blast hole work in quarries—then applied to water well drilling. This proved so profitable that *another* DM-2 was purchased on Nov. 9, 1955. And in April, 1956, a TRUCM unit was obtained for use solely as a high-speed, highly mobile water well drilling rig. As business and profits increased, *two more* DM-2s were purchased—in July and August of 1956. And on Sept. 17, 1957, the entirely new TRUCM-3 unit, on I-R's specially designed Crane Carrier vehicle, completed the present Drillmaster fleet. All six units use the I-R DOWNHOLE drill—the ideal setup for hard rock water well drilling. To prove the point, one TRUCM-3 unit drilled 50 wells in granite in 3 months, averaging 100′ per day.

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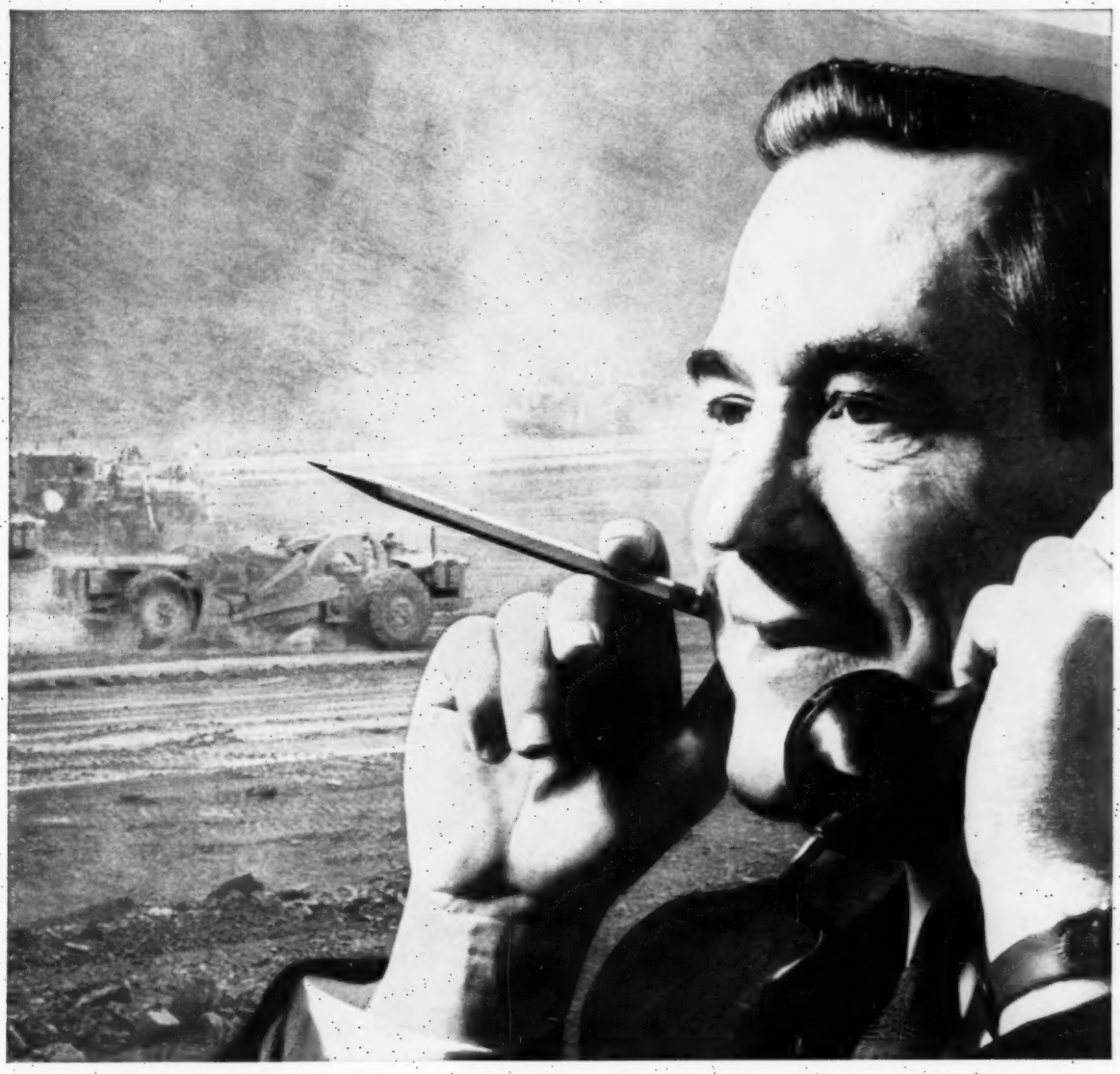

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Plowing through the muddy roadbed of U.S. Route 301, Dickerson, Inc. of Monroe, N.C., turned up a lot of evidence that Gulf makes things run better.

Even under normal conditions the clearing, grading and installation of grade separations on this job would have been tough enough.

But under the unusually wet conditions they met, their earth handling equipment took extra punishment from the word go. They moved over 1,250,000 cubic yards of unclassified material. They sank more than 16,000 feet of underground drainage pipe, in addition to conventional culverts. They finished on time.

Throughout the project, Gulf made things run better in more ways than one. Mr. W. L. Howerton, general superintendent of grading, reports: "We had to keep our machines in first class shape—to get the peak performance needed under these severe conditions. That's one reason we selected Gulf fuels and lubricants. Half my worries were eliminated, knowing we had a dependable source of supply, with quick and sure service."

A winning team. Left to right: W. L. Howerton, general superintendent of grading for Dickerson, Inc.; W. C. Ritchie, Gulf Sales Representative; N. K. Dickerson, president of Dickerson, Inc.; D. E. Smith, foreman, bridge department, Dickerson; R. W. Parks, Jr., general superintendent, bridge department.

Dickerson equipment runs better on Gulf fuels and lubricants. Included on this job were: 3 sheep-foot rollers, 4 motor graders, 10 pans, 3 draglines, 2 push tractors, 4 dozers, 2 truck cranes.

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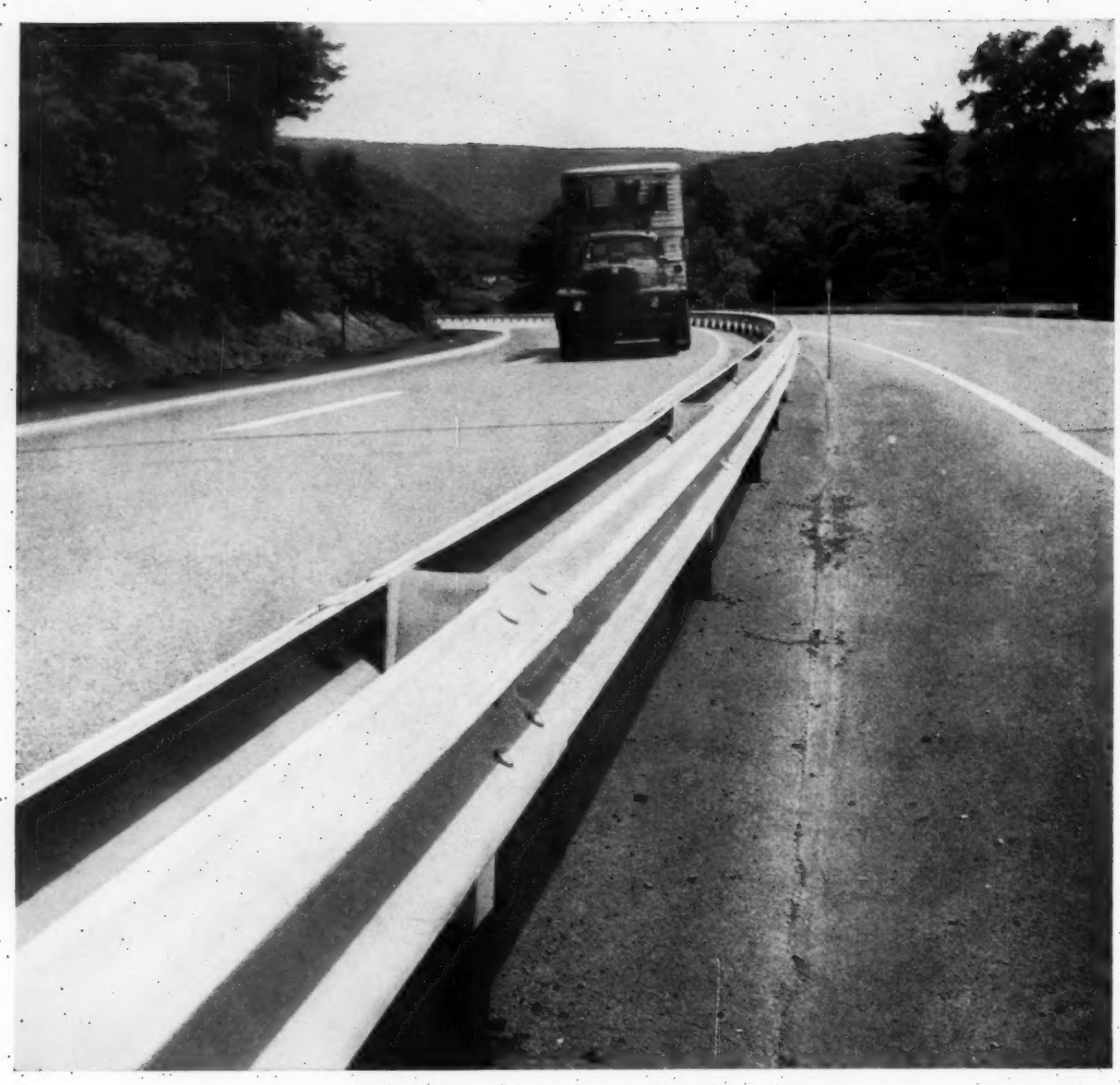

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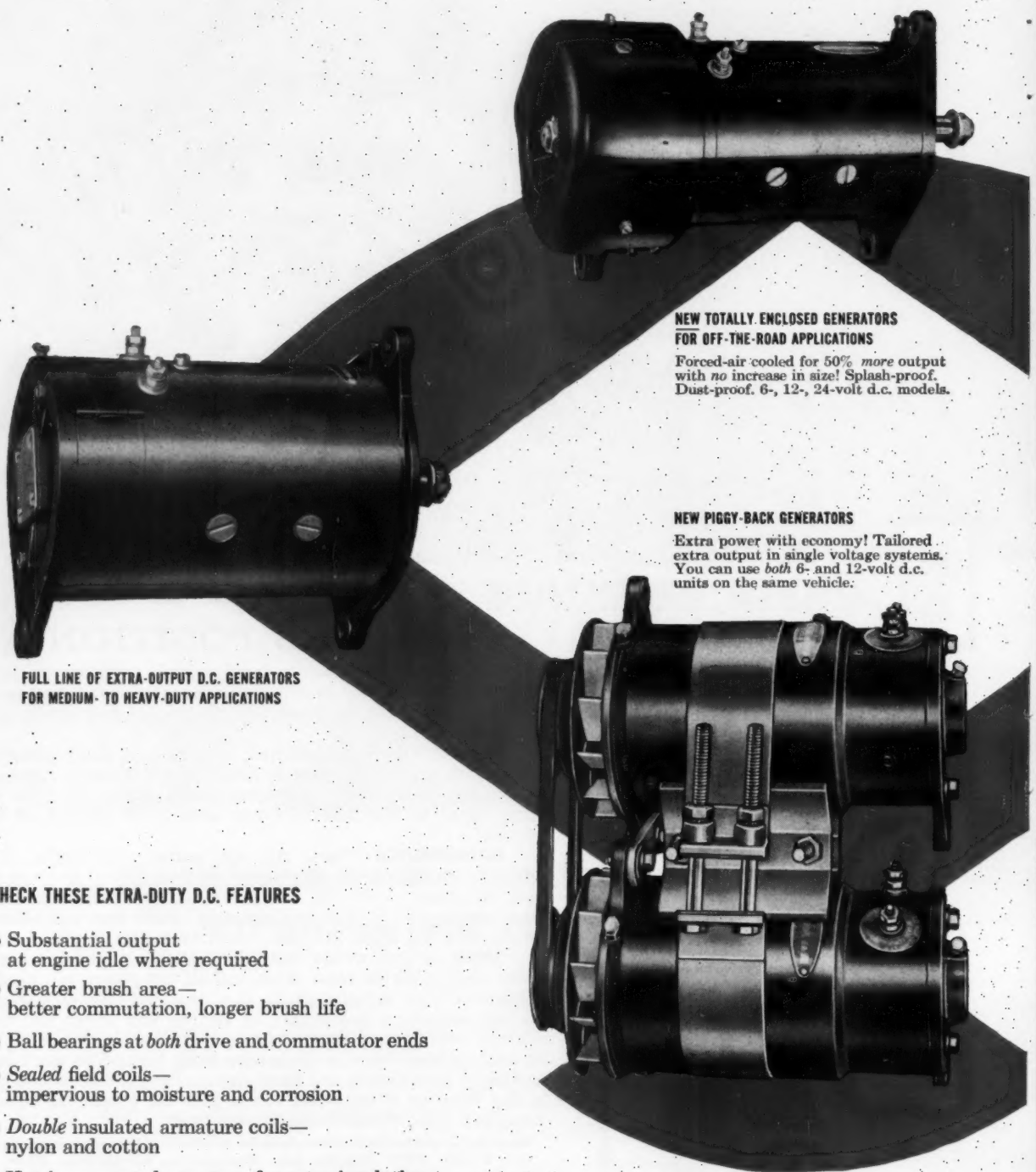

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- Substantial output at engine idle where required
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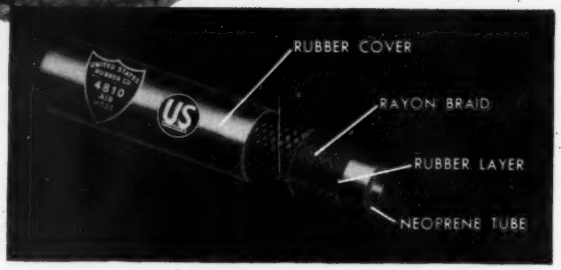

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Yet, despite its great strength, 4810 is no muscle-bound hose. "U.S." engineering has made it easier to handle, readily flexible, able to take higher working pressures—*and less expensive*—than the conventional air hose you might be using. It's one of a complete line of U.S. Rubber construction hose.

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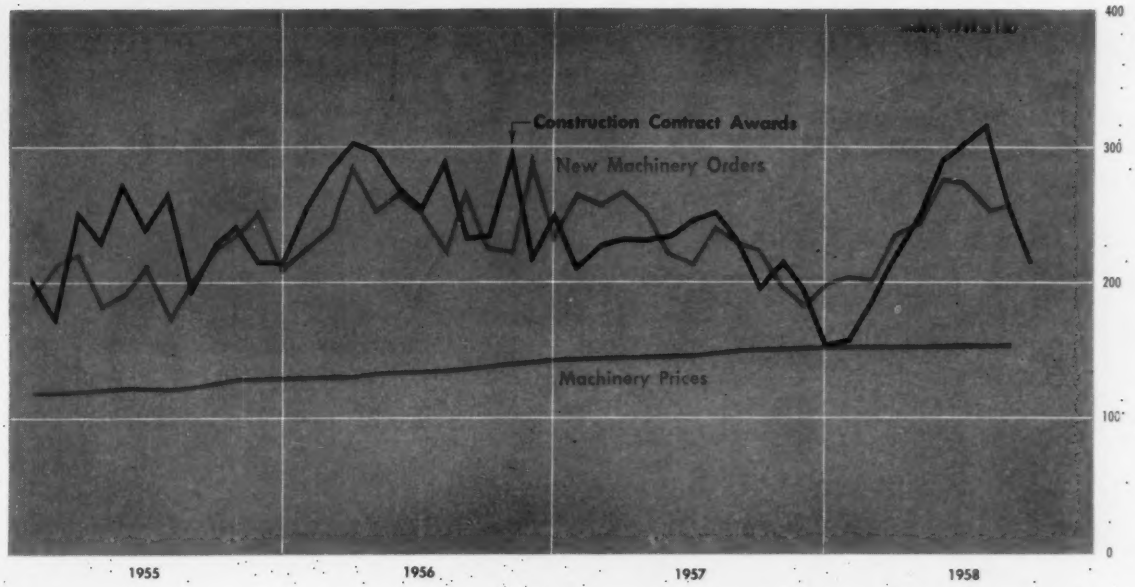
Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

Trends in the Machinery Market



Price Index

	AUGUST 1958	MONTH AGO	YEAR AGO	% CHANGE 1957-1958
All Types of Equipment	165.6	165.6*	161.4	+2.6
Cranes; Draglines, Shovels	**163.8**	**163.8**	**160.2**	**+2.2**
Shovel, ½ cu yd	154.0	154.0	150.9	+2.1
Shovel, ¾ cu yd	167.7	167.7	162.9	+2.9
Shovel, 1-1½ cu yd	178.4	178.4	172.4	+5.0
Shovel, 2-2½ cu yd	154.4	154.4	147.1	+2.8
Shovel, 3-3½ cu yd	162.7	162.7	158.3	+2.8
Shovel, 6 cu yd	180.7	180.1	176.5	+2.4
Crane, truck mounted	164.2	164.2	162.1	+1.3
Crane, tractor mounted	135.1	135.1	131.7	+2.6
Bucket; clam shell	152.7	152.7	152.7	0
Bucket, dragline	180.8	180.8	180.8	0
Scrapers and Graders	**158.8**	**158.8**	**156.5**	**+1.5**
Scraper, 4 Wheel, 8-10.5 cu yd	155.0	155.0	155.0	0
Scraper, 4 Wheel, 12-15 cu yd	151.3	151.3	151.3	0
Scraper, 2 Wheel, 14-18 cu yd (a)	122.7	122.7	118.4	+3.6
Grader, heavy duty	164.0	164.0	161.6	+1.5
Grader, light & medium	161.2	161.2	159.8	+0.9
Tractors (non-farm, incl industrial)	**180.5**	**180.5**	**175.2**	**+3.0**
Wheel-type, off highway (a)	128.4	128.4	122.1	+5.2
Crawler-type, 45-60 dph	182.6	182.6	177.6	+2.8
60-80 dph	185.8	185.8	183.4	+1.3
80-120 dph	186.7	186.7	182.4	+2.4
120 and up dhp	191.8	191.8	183.5	+4.5
Machinery, Tractor Mounted	**161.7**	**161.7**	**160.4**	**+0.8**
Dozer, cable controlled	151.6	151.6	151.6	0
Dozer, hydraulic controlled	177.3	177.3	175.1	+1.3
Cable power control unit	147.9	147.9	147.9	0
Loader, shovel type	153.9	153.9	151.8	+1.4
Specialized Machinery	**150.7**	**150.7**	**144.8**	**+4.1**
Ditcher	154.1	154.1	151.8	+1.5
Roller, tandem	193.2	193.2	181.7	+6.3
Roller, 3 wheel	161.6	161.6	154.8	+4.4
Ripper and rooter	143.3	143.3	143.3	0
Dewatering pump, 10 M gph	111.7	111.7	108.1	+3.3
Dewatering pump, 90 M gph	144.3	144.3	133.3	+8.3
Portable Air Compressors	**159.1**	**159.1**	**156.6**	**+1.6**
Contractor's Air Tools	**164.5**	**164.5**	**164.3**	**+0.1**
Mixers, Pavers, Spreaders	**150.1**	**150.1***	**143.1**	**+4.9**
Mixer, portable, 11 cu ft	160.1	160.1	155.4	+3.0
Mixer, portable, 16 cu ft	163.7	163.7	159.6	+2.6
Mixer, truck, 6 cu yd	127.3	127.3	122.1	+4.3
Mixer, paving, 34 cu ft	185.2	185.2	174.6	+6.1
Concrete finisher & spreader	181.5	181.5*	171.1	+6.1
Bituminous distributor	122.4	122.4	115.9	+5.6
Bituminous spreader	160.3	160.3	160.3	0
Bituminous paver	153.0	153.0	149.8	+2.1
Off-Highway Trucks, Wagons (b)	**99.9**	**99.9**	—	—
Contractors off-highway truck (b)	99.9	99.0	—	—
Trailer dump wagon (b)	100.0	100.0	—	—

• a January, 1955=100 • b January, 1958=100 * Revised
BLS Primary Market Price Indexes, U.S. Department of Labor, 1947-49=100

Machinery Prices Continue Steady

Manufacturers' prices of construction machinery were steady for the tenth consecutive month in August. The Bureau of Labor Statistics price index of 165.6 (based on 1947-49 prices as 100) was exactly the same on August 15 as it was on January 15, and it was only slightly higher than the 164.9 value for October, 1957.

This is the longest period of stability in construction machinery prices since 1954. But the prospects for continuing stability are not bright.

Wages will go up under the provisions of the new contracts signed last month. The wage increase figures out smaller than those during 1955-57 when wage hikes contributed to a rapid rise in machinery prices. But the 1958 increases in wages, plus an advance in steel prices, probably will bring moderate increases in machinery prices during the next few months.

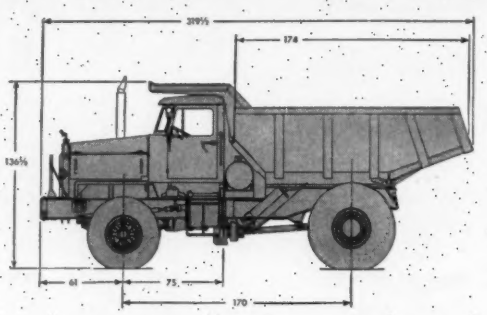
The big improvement in machinery sales since early 1958 also may encourage price boosts. New orders turned upward in August, according to the McGraw-Hill Department of Economics Index. Though the August index value of 254 (based on 1949 as 100) was not up to the 1958 high of 274 in May, it was 2% above July. Moreover, orders topped a year ago by 11%, making August the fourth consecutive month in which contractors bought more new machinery than in the corresponding month of 1957.

By contrast, contractors found their new business dropping. This trend continued during September when the Construction Methods Heavy Construction Contract Index declined to 215, (based on 1949=100). September contract volume was 8% greater than the low volume of a year ago.

MACKS FOR EVERY

MACK MODEL LVX

As a 22½-ton rear dumper, the off-highway LVX offers maximum payloads at minimum unit cost. With either a 320- or 335-h.p. diesel engine, an over-gear transmission with two-speed compound or torque converter, and Mack's Planidrive rear axle . . . the LVX is a top performer under all operating conditions. Maximum driver efficiency is assured by such features as ideal steering wheel position, power steering, two-plate air-assisted clutch, and Mack offset cab with extreme left driver position offering maximum view front and rear. From top to bottom, this Mack has the features that have made it the popular "big boy" for heavy construction.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 22½ tons.

DIESEL ENGINES: 320 h.p., supercharged Cummins; 335 h.p., turbocharged Cummins.

TRANSMISSIONS: Mack, selective, constant mesh, 8 speeds forward, 2 reverse; converter and Mack 4-speed transmission; Torqmatic converter and transmission.

CLUTCH: Mack two-plate, air assist with manual actuation.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gears within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Alloy steel, wide flange I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 14.00-24 (16P) rib or 14.00-24 (20P) rib; rear, 18.00-25 (24P) lug.

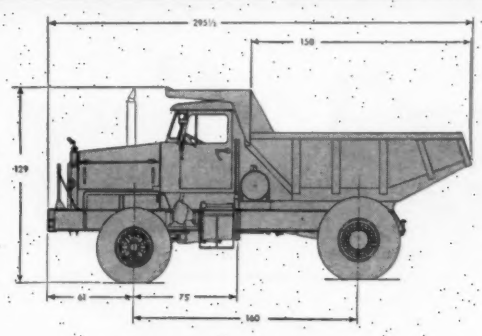
WHEELS: Cast, spoke.

STEERING: Hydraulic power steering, 62' turning circle diameter.

DUMP HOIST: Twin, double-acting, outboard mounted, three-section telescopic cylinder assembly, providing 70° dumping angle.

CONSTRUCTION JOB

excavating...
filling...
equipment hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 15 tons.

DIESEL ENGINES: 172 h.p., naturally-aspirated Mack Thermodyne; 220 h.p., naturally-aspirated Cummins; 205 h.p., turbo-charged Mack Thermodyne.

TRANSMISSION: Mack, selective, constant mesh, 10 speeds forward, 2 reverse.

CLUTCHES: Mack single-plate, 253 sq. in. engagement (for 170 h.p. Mack Thermodyne); Mack two-plate, 416 sq. in. engagement for other sizes.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam.

REAR AXLE: Mack Planidrive, with final reduction through planetary gear train within wheel hubs.

BRAKES: Full air, with 12 cu. ft. compressor.

FRAME: Wide flange, rolled section I-beam.

SPRINGS: Front, semi-elliptic with Rubber Shock Insulator suspension; rear, progressive-rate semi-elliptic with cam face slipper ends and radius rod.

TIRES: Front, 12.00-24 (16P) rib, 13.00-24 (18P) rib; rear, 14.00-24 (18P) lug, 16.00-25 (20P) lug.

WHEELS: Cast, spoke.

STEERING: 60' turning circle diameter.

DUMP HOIST: Twin, double-acting, 8" cylinders providing 70° dumping angle.

MACK MODEL LRX

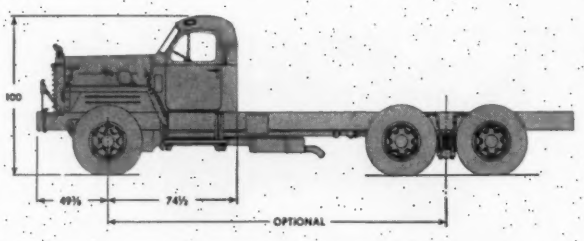
The 15-ton LRX offers outstanding maneuverability with off-highway stamina and capacity. Powered with either a Mack or Cummins diesel engine and equipped with a Mack ten-speed transmission and Planidrive rear axle assembly, the LRX is an efficient performer on long hauls as well as steep grades. Powerful air brakes, carefully engineered cab, and rugged unified frame assembly have long made the LRX a popular model for earth or rock hauling.

For capacities of 30 tons or more where maximum flotation is required, a full line of tandem rear axle Macks is available.

MACKS FOR EVERY

MACK B-80 SERIES

B-80 tractors for heavy-duty flat bed and dump trailer hauling, and B-80 truck chassis for large capacity dumper, mixer, and stake body operations have run up an unequaled record for economy and dependable service in all phases of construction work. Available in four- and six-wheel models including six-wheel drive models, B-80's are powered with 170 to 232 horsepower Mack Thermodyne gasoline or diesel engines, or with Cummins diesels in the 220 to 320 horsepower class.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 6 to 12 cubic yards; mixer, 7½ to 8½ cubic yards (6-wheelers) (larger with special provision).

ENGINES: Gasoline: Mack Thermodyne, 232 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p., with turbocharger. Cummins, 220 h.p.; 320 h.p., with supercharger.

TRANSMISSIONS: Mack: Five-speed, direct or overgear. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

FRONT AXLE: Mack, heavy-duty, drop-forged I-beam. Mack, front wheel drive, for 6x6 chassis.

REAR AXLES: Four-wheelers: Mack Dual Reduction, with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider.

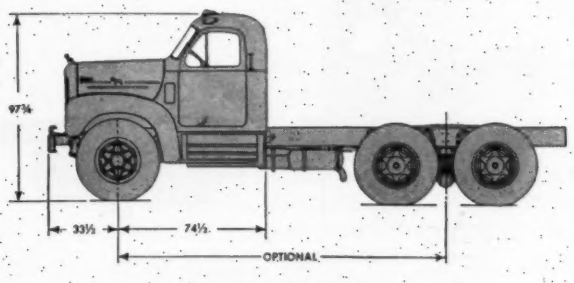
FRAME: Channel: Alloy-steel, heat-treated; channel reinforcement, standard.

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler); 11.00-22, 11.00-24, 12.00-24 (Six-wheeler). Size availability contingent upon bogie.

STEERING: Hydraulic-power steering (optional extra).

CONSTRUCTION JOB

aggregate and materials hauling



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dump, 6 to 12 cubic yards; mixer, 5½ to 7½ cubic yards (6-wheelers).

ENGINES: Gasoline: Mack Thermodyne, 185 h.p. Diesel: Mack Thermodyne, 170 h.p.; 205 h.p. with turbocharger.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off; ten-speed and auxiliary. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Three available sizes.

REAR AXLES: Four-wheelers: Mack Dual Reduction—with radius rods and torque arms. Six-wheelers: Mack Balanced Bogie, Dual Reduction, through-drive, interaxle Mack Power Divider. Three bogie sizes available.

FRAME: Channel: Alloy-steel, heat-treated, pressed; channel reinforcements for maximum services (standard or optional extra).

TIRES: Available sizes and types: 11.00-24, 12.00-24 (Four-wheeler). 10.00-20, 10.00-22, 11.00-20, 11.00-22, 11.00-24 (Six-wheeler). Size availability contingent upon bogies required.

STEERING: Hydraulic-power type (optional extra).

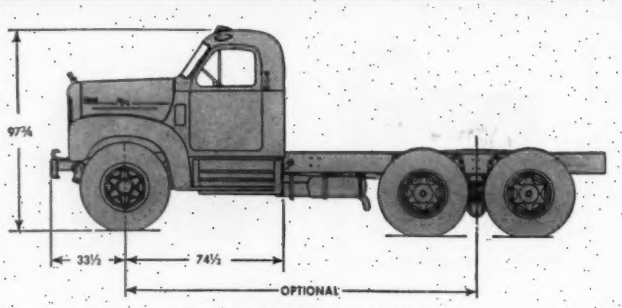
MACK B-60 SERIES

As dumpers, mixers, tractors, and flat-bed trucks, Mack B-60's are the acknowledged workhorses of contractors everywhere because of their dependable and efficient performance for a wide range of jobs. They are powered with Mack Thermodyne gasoline or diesel engines in either the 170 or 205 horsepower range. Both four- and six-wheel units are available. Six-wheel models use the exclusive Mack Balanced Bogie with interaxle Power Divider, the sure-footed drive that directs power more to the wheels having the greater traction.

MACKS FOR EVERY

MACK B-40 SERIES

Available in four- and six-wheel models including six-wheel drive models, the B-40 series, slightly smaller than the B-60's, is especially valued for its bonus capacities, handling ease, and economical operation. B-40 dumpers, tractors, mixers, and flat-bed trucks use either Mack 150-horsepower Thermodyne diesel or Magnadyne gasoline engines. Like all Macks, the B-40 series is engineered and built with precision and thoroughness . . . your assurance of dependable and cost-saving operation.



CONDENSED SPECIFICATIONS

PAYLOADS: Rear dumper, 5 to 10 cubic yards; mixer, 5½ to 6 cubic yards (6-wheeler).

ENGINES: Gasoline: Mack Magnadyne, 150 h.p. Diesel: Mack Thermodyne, 150 h.p.

TRANSMISSIONS: Mack: Five-speed, direct. Ten-speed (two-lever) Duplex. Twenty-speed Quadruplex. Ten- and twenty-speeds, both "On" and "Off" Highway types. Five-speed and auxiliary, with or without tower power take-off. Availability contingent upon chassis models.

FRONT AXLES: Mack, heavy-duty, drop-forged I-beam. Four sizes. Mack, front-wheel drive (for 6x6 chassis).

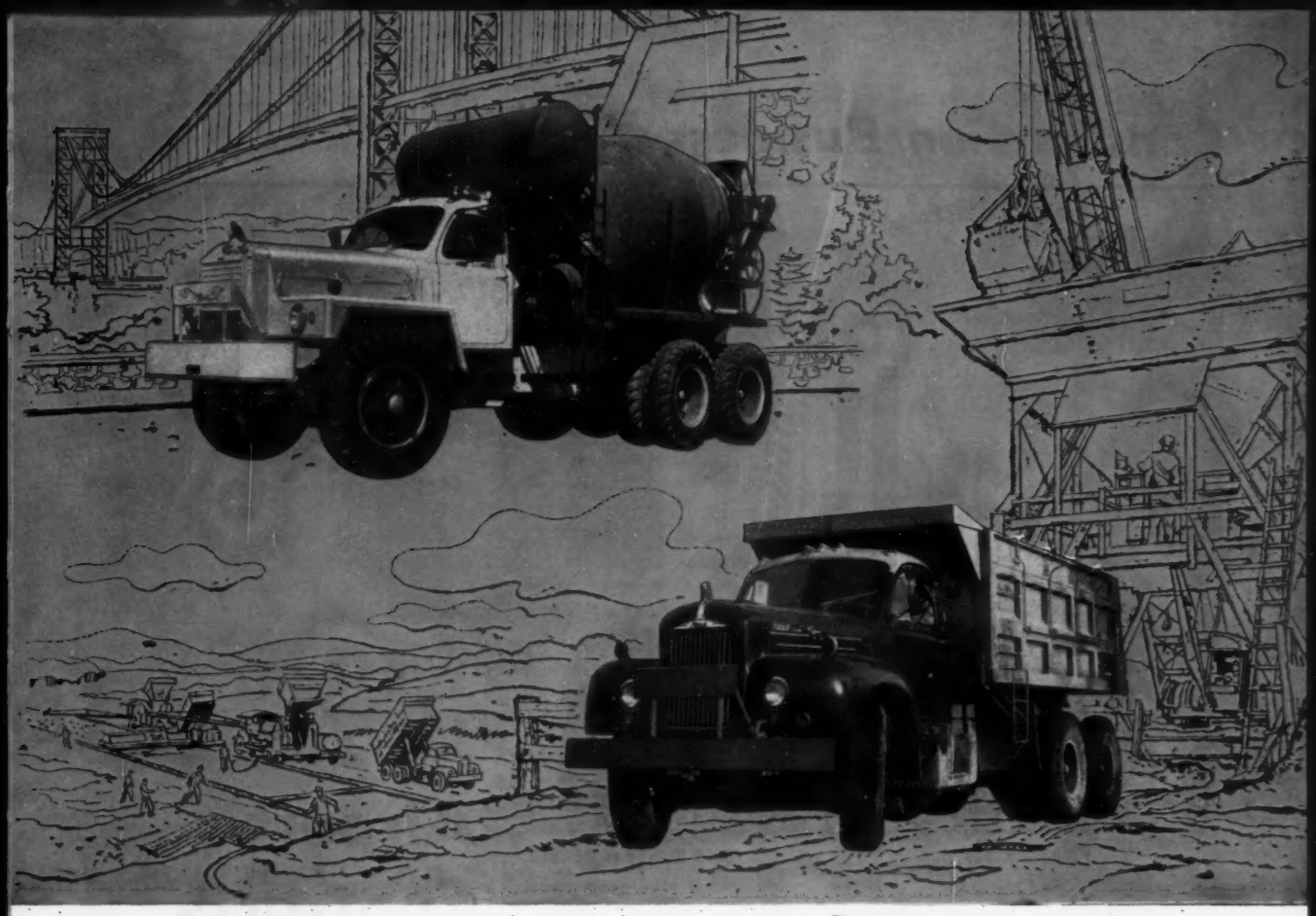
REAR AXLES: Four-wheelers: Mack Dual Reduction. Six-wheeler Bogie: Mack Balanced Bogie, Dual Reduction, through-drive, inter-axle Mack Power Divider.

FRAME: Channel: Alloy-steel, heat-treated, pressed; appropriate inside channel reinforcement (standard or optional extra).

TIRES: Available sizes and types: 10.00-20, 11.00-20, 11.00-22 (Four-wheeler). 8.25-20, 9.00-20, 10.00-20, 10.00-22, 11.00-20 (Six-wheeler). Availability contingent upon chassis.

STEERING: Hydraulic power steering (optional extra).

Illustrations are not necessarily representative of standard specifications.



CONSTRUCTION JOB

concrete, dry-mix, and asphalt hauling

ONLY MACK OFFERS ALL THESE PROFIT-POWER FEATURES

A truck or tractor for every construction job. Dumpers, concrete mixers, tractors, flat-bed trucks—there are dependable, economical Macks for every important construction task . . . right up to the biggest. Moreover, when you standardize on Macks, you gain the added savings of a completely integrated parts and upkeep operation.

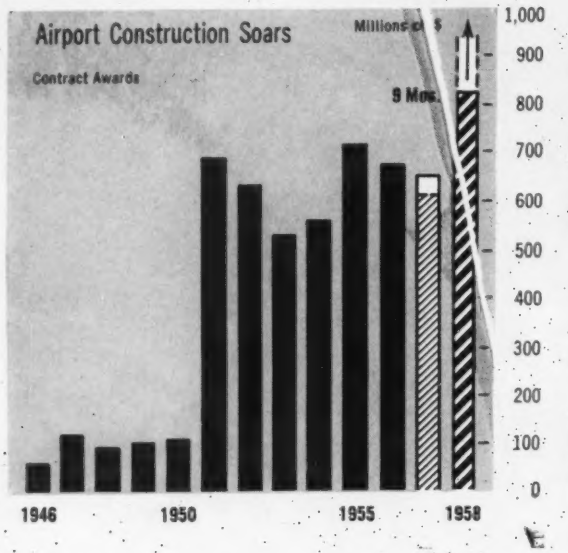
Widest choice of engines. To meet your needs exactly, Mack offers a choice of proved, dependable engines in every power range: Mack Thermodyne® diesel or Mack gasoline engines at 150 h.p. . . . Mack Thermodyne diesel, Mack gasoline or Cummins diesel units in the 170-232 h.p. range . . . and Cummins diesels from 250 to 450 h.p.

Unequaled performance and economy. Every Mack is fashioned from the finest, most durable materials . . . crafted to the highest standards of strength, stamina and precision in the industry. Mack controls this quality by making more of its own major components—engines, clutches, brakes, transmissions, bogies, cabs, etc.—than any other maker. Every Mack is engineered for fast, simple accessibility. And every Mack is "Built like a Mack"... made to outlast, outwork, and outearn anything else on demanding jobs.

Parts and service wherever you operate. Mack has spared no effort or investment to provide every Mack owner—everywhere—with the fullest parts-and-service coverage. There is a Mack branch or distributor close to your job who carries *nearly* any part you'll need on the job . . . and behind them are Mack parts depots that can ship out *any* replacement part at a moment's notice.

MACK
first name for
TRUCKS

Mack Trucks, Inc., Plainfield, New Jersey
In Canada: Mack Trucks of Canada, Ltd.



Airport Construction Contract Awards

Reported by Construction Methods & Equipment in millions of dollars

Year	Federal: Airports Airbases	Federal: Hangars Buildings	Federal: Housing	Federal: Facilities Utilities	Federal: Total Federal	City & County	Private	Grand Total
1946..	9.9	5.0	8.5	1.7	25.1	24.6	12.8	62.5
1947..	36.4	11.9	15.0	10.2	73.4	47.8	0.3	121.5
1948..	5.1	7.1	0.5	5.1	17.8	75.6	1.3	94.7
1949..	6.6	17.1	12.6	8.7	45.0	59.4	1.5	105.9
1950..	7.1	28.2	1.5	7.3	44.1	64.4	3.6	112.2
1951..	234.1	183.0	103.8	106.7	627.6	51.4	11.9	690.9
1952..	96.7	242.5	99.8	128.7	567.7	46.4	20.9	634.9
1953..	125.8	248.4	25.7	85.2	485.1	41.3	9.8	536.2
1954..	171.8	240.6	28.2	95.6	536.2	25.9	5.8	567.9
1955..	190.2	286.9	49.7	133.0	659.8	51.0	4.7	715.4
1956..	130.4	218.5	78.3	142.9	570.0	97.3	13.9	681.3
1957..	184.1	212.7	53.8	107.7	558.3	89.8	8.9	656.9
9 Mos.								
1957..	178.7	199.5	49.0	102.1	529.3	78.8	7.8	615.9
1958..	336.3*	190.5	47.8	139.5	714.1	97.3	17.3	828.7
% Chg	+88	−5	−2	+37	+35	+23	+122	+35

*Includes $82.7 million for missile facilities.

Public Airport Construction Plans*

Plans are big . . . **. . . but more money is needed**

State	Total Airports	Number reporting plans	Cost of projects planned‡ (millions)	Local funds now in hand or expected	Additional funds needed	Federal funds allocated, fiscal 1959
US Total	**2,974**	**1,138**	**$1,066.9**	**$589.7**	**$477.3**	**$63.2**
Alabama	45	16	16.3	8.1	8.1	1.18
Arizona	34	11	11.1	6.5	4.6	1.13
Arkansas	36	10	1.7	1.1	0.6	0.25
California	234	43	128.6	101.9	26.7	6.48
Colorado	56	18	24.2	11.5	12.7	0.62
Connecticut	8	9	11.9	6.7	5.2	0.41
Delaware	3	0	—	—	—	0.10
Florida	100	12	11.8	9.4	2.4	2.54
Georgia	63	13	21.6	11.3	10.3	1.29
Idaho	98	19	3.1	0.5	2.6	0.18
Illinois	50	87	82.2	61.2	21.0	3.59
Indiana	37	39	14.4	7.8	6.6	0.97
Iowa	61	49	8.3	4.6	3.7	0.46
Kansas	110	8	0.3	0.1	0.2	0.14
Kentucky	23	37	19.9	10.0	9.9	1.29
Louisiana	42	11	16.4	12.2	4.3	1.74
Maine	28	14	3.6	1.8	1.8	0.15
Maryland	12	5	13.6	1.7	11.9	0.53
Massachusetts	23	38	26.8	5.7	21.1	1.71
Michigan	128	125	64.2	34.7	29.5	2.55
Minnesota	97	19	29.5	16.9	12.6	1.90
Mississippi	35	19	4.6	3.9	0.7	0.74
Missouri	49	19	13.3	5.6	7.8	1.71
Montana	103	24	5.0	2.0	3.0	0.21
Nebraska	79	13	6.1	2.7	3.4	0.60
Nevada	51	8	5.8	3.2	2.6	0.68
New Hampshire	13	9	1.9	0.9	0.9	0.46
New Jersey	13	4	28.7	13.7	15.0	0.94
New Mexico	47	17	16.5	7.8	8.7	1.09
New York	49	26	135.4	67.3	68.1	4.24
North Carolina	36	8	12.0	4.8	7.2	0.99
North Dakota	68	12	1.7	0.9	0.8	0.13
Ohio	47	20	40.8	13.6	27.2	2.87
Oklahoma	75	17	25.2	14.6	10.6	1.81
Oregon	54	15	7.6	4.8	2.7	1.02
Pennsylvania	49	29	91.3	45.6	45.7	3.90
Rhode Island	4	4	3.0	1.5	1.5	0.15
South Carolina	34	20	5.2	2.8	2.4	0.17
South Dakota	55	28	1.6	0.8	0.9	0.02
Tennessee	43	41	28.1	19.0	9.1	1.52
Texas	181	35	28.3	15.5	12.8	3.57
Utah	47	17	8.8	4.5	4.2	0.58
Vermont	11	11	2.3	1.1	1.1	0.15
Virginia	31	22	8.8	3.7	5.0	0.96
Washington	89	17	8.1	4.6	3.5	0.64
West Virginia	27	9	8.9	4.1	4.9	0.57
Wisconsin	63	29	15.2	7.7	7.5	1.65
Wyoming	37	23	2.2	1.2	1.0	1.69
Alaska	178	51	15.9	1.8	14.1	1.35
Hawaii	14	5	21.2	14.0	7.2	0.75
Puerto Rico	4	3	4.1	2.3	1.8	0.95

*For four years July 1, '58 to June 30, '62 — National Airport survey by National Association of State Aviation Officials, Airport Operators Council and American Association of Airport Executives. ‡Includes Alaska, Hawaii and Puerto Rico.

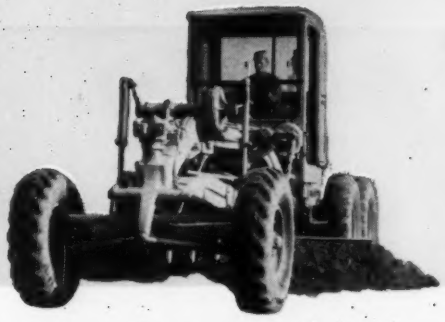
Airport Contracts Hit New High

THE RUSH to build new airports and add to existing facilities puts airport construction very near the top of the list of fast-growing types of new business for contractors. Airport construction awards are 36% above last year, according to contracts reported by *Construction Methods* during the first nine months. In fact, the total to date of $838 million is well above the full 12-month volume for any year since World War II. It exceeds 1955's postwar high by 17%.

Most of the 1958 rise is due to more military airbase construction, which has received a substantial lift from missile facility awards. But big gains over last year are also on the books for city and county public airports, up 26%, and for privately owned projects, up 122%.

continued on page 53

Cat No. 12 Motor Graders!



BEST BUY FOR 20 YEARS—BEST BUY TODAY!

Here's why: When the No. 12 was introduced in 1938, it set new performance standards to become the leader in this type of equipment. Today it *still* is the leader, because Caterpillar has constantly built improvements into it.

Shown here are *some* of the many changes that have been made in the No. 12 to keep it the unquestioned leader. Its exceptional dependability and high resale value are common knowledge. Dollar for dollar, the No. 12 is the most valuable motor grader that you can own.

Compare today's No. 12 with any other motor grader—compare it with older No. 12s, too. By any measure you'll find it has grown in work ability, matched to meet today's exacting construction and road maintenance needs. For complete information about this modern, heavy-duty machine, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

FIND YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

CATERPILLAR

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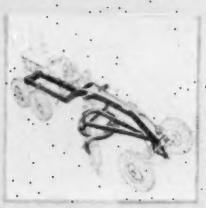
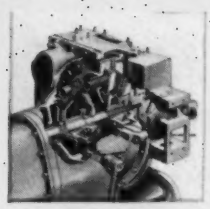
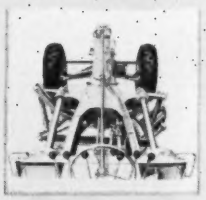
NO. 12 MOTOR GRADERS—BEST BUY BY ANY YARDSTICK!



Longer main frame adds extra clearance between the toe of the blade and the front tire for all blade positions. There's ample blade maneuvering space whether the No. 12 is equipped with 13.00-24 or 14.00-24 front tires. Curved side shift rack permits fast, easy blade positioning—all common blade positions are available to the operator without leaving the cab.

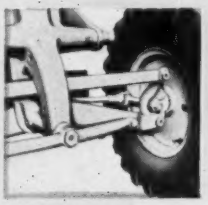


Exclusive oil clutch, the most advanced clutch design ever offered in a motor grader, provides up to 2,000 hours without adjustment. This is equivalent to about 12 months of "adjustment-free" operation. And because wear rate of clutch facings is so slight, down time for clutch repair is virtually eliminated. The oil clutch accounts for a large part of the No. 12's reputation of dependability.

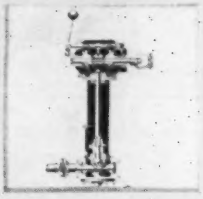


Unequalled visibility results from the No. 12's dash-mounted lift gears and low frame design. While seated, the operator has an unobstructed view of the critical areas at the front wheels, toe of the blade and circle. In-cab starting and easy-to-reach controls are other No. 12 features that help the operator work more efficiently.

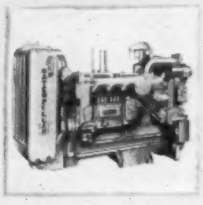
Optional Preco Automatic Blade Control, available only on Cat Motor Graders, controls blade slope to an accuracy of within ¾" in 10', regardless of position of grader. Operator merely dials the required slope on the control, then follows the guide lines. Preco-equipped No. 12s cut conventional grading time as much as 50%.



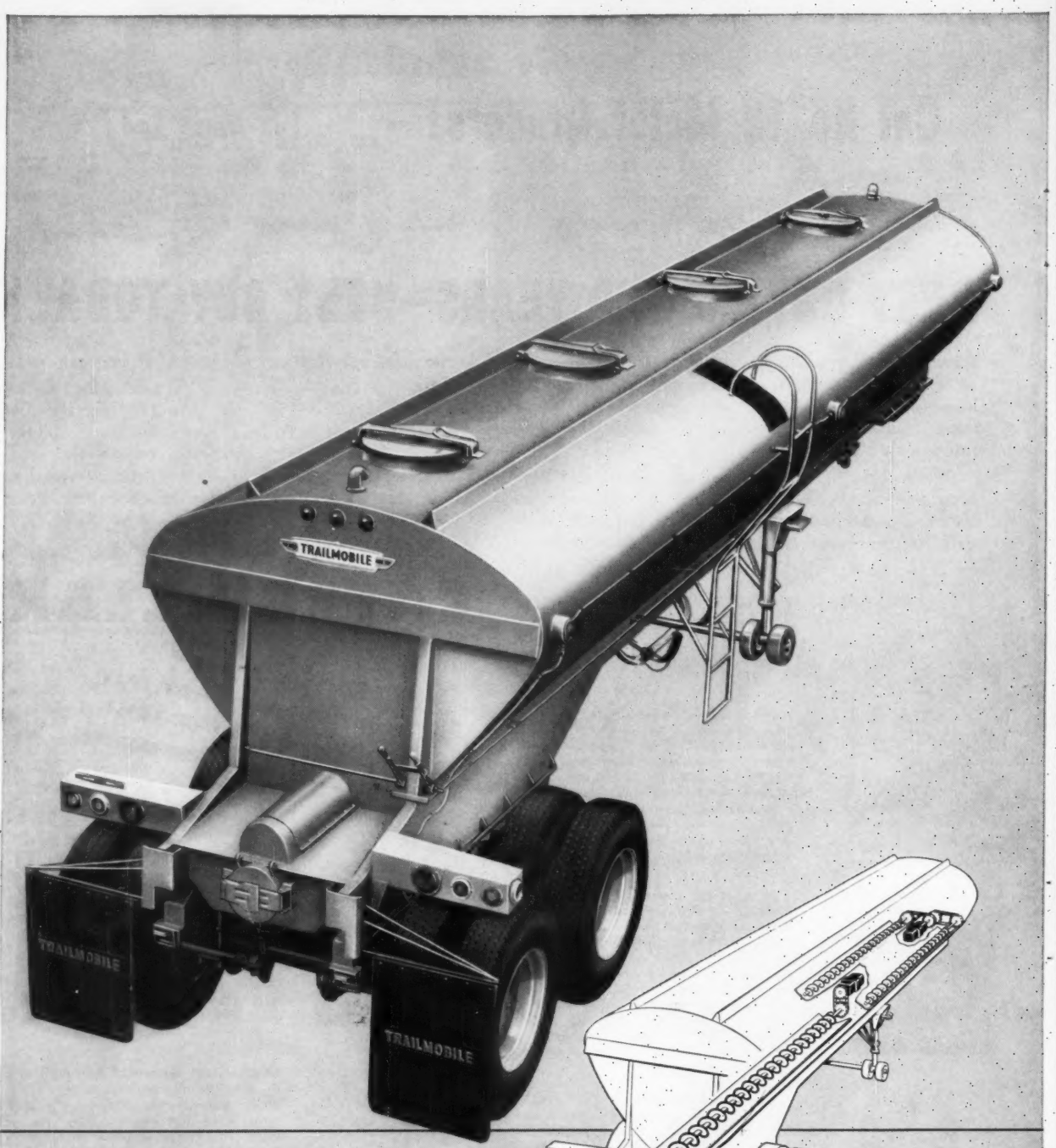
Improved service life is built into the No. 12 with larger king pins and bushings, larger inboard spindle bearing, new steering arm pivot block with seals, improved steering booster with outboard bearing. No other motor grader can surpass the No. 12 for rugged construction—another important factor in the machine's dependability story.



Mechanical controls, standard on the No. 12, offer positive action, make blade adjustments precise. Powered right from the engine, they give a speed and range of blade movements no other unit can match. More than one lever can be operated at a time, without slowing blade movement. "Anti-creep" braking mechanism makes the blade "stay put" while under load.



Modern heavy-duty Cat No. 12 Engine features, among other advantages, the exclusive Caterpillar fuel injection system. This permits the use of economy-type fuels without fouling. The long-life reputation of Cat Diesels is well known—no other engine can match them for dependability!



New hydraulically powered discharge system retains famous Trailmobile 2-stage conveyor but utilizes 3 screws as shown at right. *Two* hydraulic motors—independently controlled—are located at the drive sprocket of the screws to eliminate the necessity of clutches, counter balances and gear reduction systems. Reversing direction of the screws permits added assurance of getting stubborn loads unloaded as well as discharge at center when center opening is provided.

New Cement Tank Trailer

NEW shape . . . NEW low weight . . . NEW hydraulic discharge system

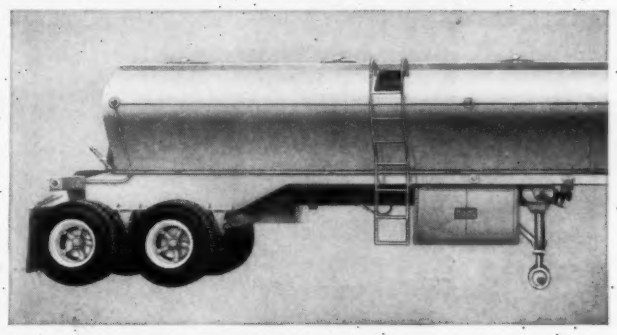
The many innovations offered in this new Trailmobile promise unprecedented advantages to operators.

Its unusually light weight provides for maximum payloads. Its simplified unloading mechanism permits precise control of screw speeds. Its overall design promises a substantial savings in maintenance.

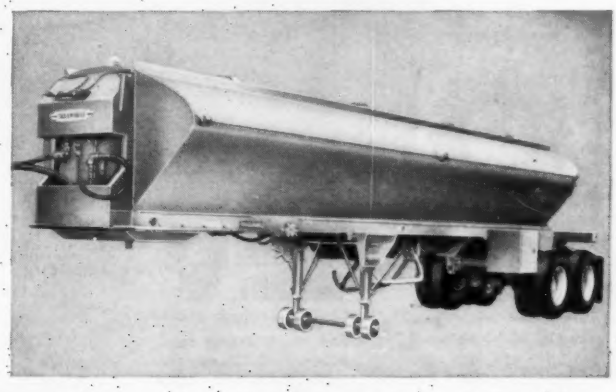
This is a lighter trailer because its vessel has a radically different shape which allows it to support as well as contain the load. It is a more versatile trailer because discharge can be accomplished over a wide range of speeds either at the rear or center of the unit—or both—according to your specifications. And it's a more dependable trailer because of a uniquely simple, close-coupled hydraulically powered discharge mechanism.

Further, you can have all these advantages in either of *two* types. One utilizes power take-off from the tractor, while the other—a self-contained unit—mounts a gas engine-driven hydraulic pump.

These are only a few of the benefits offered you in this new concept of cement tank trailer design. For the complete story contact your nearest Trailmobile representative or use the coupon.



Self contained unit has gas engine driven pump to energize hydraulic motors. Engine is housed in cabinet at center of unit.



Continuous contour shape plus reinforcing baffles and tension members cut weight without sacrifice of strength. Note the smooth clean lines of this fine trailer.

TR-702

TRAILMOBILE INC.

Cincinnati 9, Ohio • Springfield, Missouri
Longview, Texas • Berkeley 10, California

TRAILMOBILE INC., 31st and Robertson, Cincinnati 2, Ohio

Please send me illustrated folder containing complete information on this new lightweight cement tank.

*Name*_____

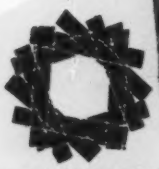
*Company*_____

*Street and No.*_____

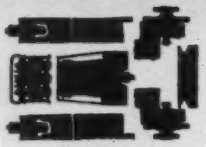
*City*_____ *State*_____

CONTRACTORS CUT COSTS WITH EIMCOS'

Move more earth at less cost with Eimco heavy-duty equipment



INDEPENDENT TRACK ASSEMBLY
Each track is powered and controlled separately — Tractor spin turns in it's own length, with one track in forward and the other in reverse.



UNIT ASSEMBLY
Each major tractor component is a separate assembly for easy maintenance or removal without disturbing other components.

INSTANT REVERSAL
No stopping, manual clutching or gear shifting to change directions — A pull on the track control levers immediately reverses the tractor.

FULL VISIBILITY
Up-front operators position eliminates all guess work in dozing, digging, pushing and loading operations.

Eimco heavy-duty earth moving machinery will permit lower bids on construction work.

Here are reports from a few jobs where Eimco equipment is being used:

1. Underground limestone quarry working an Eimco 105 on 2 levels to do all underground loading. — "Our maintenance parts and labor for the past 21 months have cost 2½ cents per ton."

2. Road contractors in the deep South — "We now have more than 17,000 hours on our 105 and have not had to open the transmission for any reason."

3. "We averaged better than 45 feet a day on our job mostly because of the 105's." — This letter from a tunnel contractor who is driving a large heading with two 105's working side by side.

4. Quarry contractor — "In a few days we should receive our third Eimco 105. These machines are gradually taking over all production and are replacing the boom shovel."

5. Railroad contractor — "Our 105 has replaced a 1½ yard boom shovel and a bulldozer we had used to move stone up to the shovel.

THE EIMCO CORPORATION • SALT LAKE CITY, UTAH
EXPORT OFFICE, 51-52 SOUTH STREET, NEW YORK, N. Y.
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

B - 346

Federal military contracts account for $721 million, or 86% of the total airport construction volume so far this year. Contracts for new airbases, runways, taxiways, and parking aprons have jumped 90% to a new postwar record. Part of this sharp rise is accounted for by $85 million of awards for missile facilities. Also up sharply are contracts for utilities at federal airports; they are running 38% above last year and will probably set a new high by year's end.

In the other two categories of federal airport construction awards, hangars and buildings are down 4% from 1957, while airport housing contracts are up 3%.

City and county airport construction is on the move to prepare for the jet age. Contracts have soared 26% above the 1957 level so far this year, and the $99-million total already exceeds the all-time for 12-months recorded in 1956.

Though private airport construction is small in volume, compared with federal and other public airports, the 1958 volume will surely be second highest on record and should come close to 1952's high.

Plans for developing our county and city airports so they can accommodate expanded propeller and jet air traffic add up to more than $1 billion. But before construction can start on all of these projects, additional funds will be needed to supplement money on hand or anticipated from local and state sources. The money problem is accentuated by President Eisenhower's veto last month of a bill which would have expanded the federal aid to airports program.

Of the 2,874 public airports in this country, Alaska, Hawaii, and Puerto Rico, 1,138 plan development projects to cost an estimated $1,067 million. These figures come from a national airport survey conducted jointly by the National Association of State Aviation Officials, the Airport Operators Council, and the American Association of Airport Executives.

These airports have on hand or anticipate from local and state sources $590 million during the four fiscal years from July, 1959 through June, 1962. But this is only 55% of the estimated cost of all the projects now planned.

Federal funds won't fill the gap unless Washington decides the federal government will share public airport construction costs.

With the current federal-aid airport program due to expire next June 30, a new program could not be legislated until next spring at the earliest. This could cause delays in allocations for fiscal 1960, thus slow down some projects.

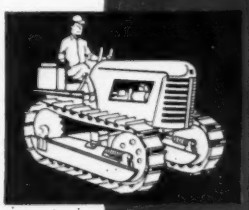
The failure of the federal-aid program to provide enough funds to enable airport construction to keep abreast of requirements points to the need for finding other solutions of the money problem at the local and state levels. Some local officials claim their airports cannot finance needed improvements and at the same time be self-supporting. But this is not at all certain. The

continued on page 56

lower initial cost

lower service cost

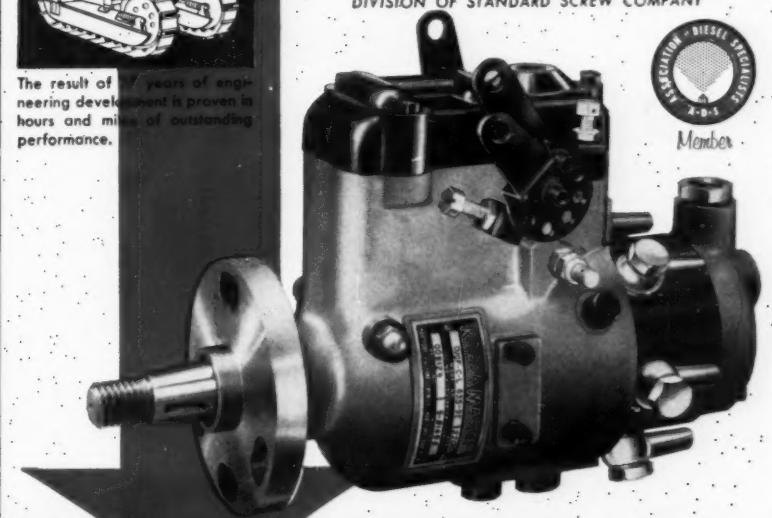
Compare and you will see the ROOSA MASTER fuel injection pump costs less. Use it and you will see that your service costs less. There are fewer parts to service and repair because of the unique design of ROOSA MASTER. It takes less space on your engine, and weighs less than 10 pounds. Even though small in size and light in weight one size serves either a 2, 3, 4, 6 or 8 cylinder engine.



The result of [illegible] years of engineering development is proven in hours and miles of outstanding performance.

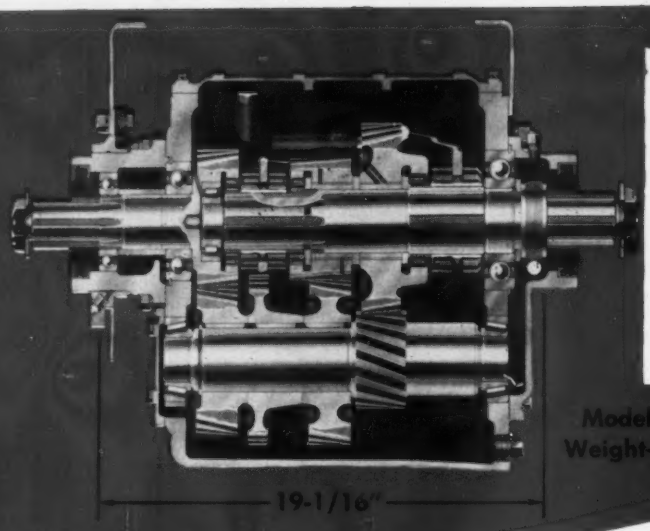
HMS ROOSA MASTER makes good diesels better

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
DIVISION OF STANDARD SCREW COMPANY



Member

YOU CAN DEPEND ON THE DIESEL THAT DEPENDS ON ROOSA MASTER



Model 3-A-65
Weight—270 lbs.

Model No.	3-A-65
Gear	Ratio
High	.754
Intermediate	1.00
Low	2.221

Now

3-speed AUXILIARY

The Fuller Manufacturing Company now offers the most complete line of three-speed auxiliary transmissions . . . for transport, logging, construction, mining and crane carrier services . . . at lower prices than competitive units in a comparative capacity range.

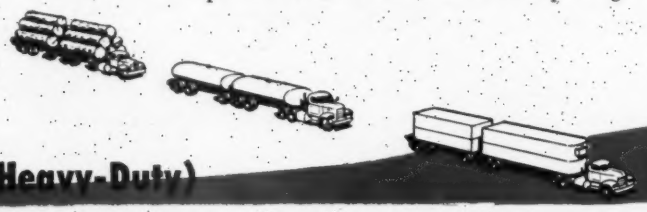
The extremely rugged heavy-duty 92 Series has been completed by the addition of 5 new sets of gear ratios, Models 3-D-92 through 3-H-92. Four new sets of gear ratios, Models 3-E-65 through 3-H-65, have been added to the popular medium heavy-duty 65 Series.

Split Gears and GO

The expanded line of three-speed auxiliary units includes splitting ratios, both underdrive and overdrive. With these splitting ratios, the engine can operate at maximum horsepower through a full range of vehicle speeds. Ideal for over-highway operation, the extra gears allow faster schedules, greater profits.

Deep Reductions

Deep reductions, in combination with splitting ratios,



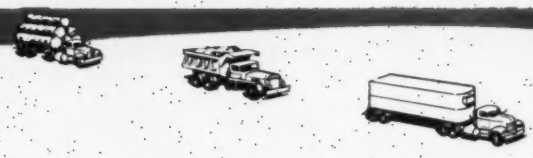
92 SERIES (Heavy-Duty)

Model No.	3-A-92	3-B-92	3-C-92	3-D-92	3-E-92	3-F-92
Gear	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
High	.74	.84	.75	.75	.84	.84
Intermediate	1.00	1.00	1.00	1.00	1.00	1.00
Low	2.09	1.24	2.64	1.24	2.09	2.64

FULLER MANUFACTURING COMPANY (Subsidiary, Eaton Manufacturing

65 SERIES (Medium Heavy-Duty)

	3-B-65	3-C-65	3-D-65	3-E-65	3-F-65	3-G-65	3-H-65
	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
	.804	.754	.804	.804	.754	1.00	1.00
	1.00	1.00	1.00	1.00	1.00	1.32	1.32
	1.239	1.239	2.221	1.74	1.74	2.221	1.74



. . . the most complete line of TRANSMISSIONS

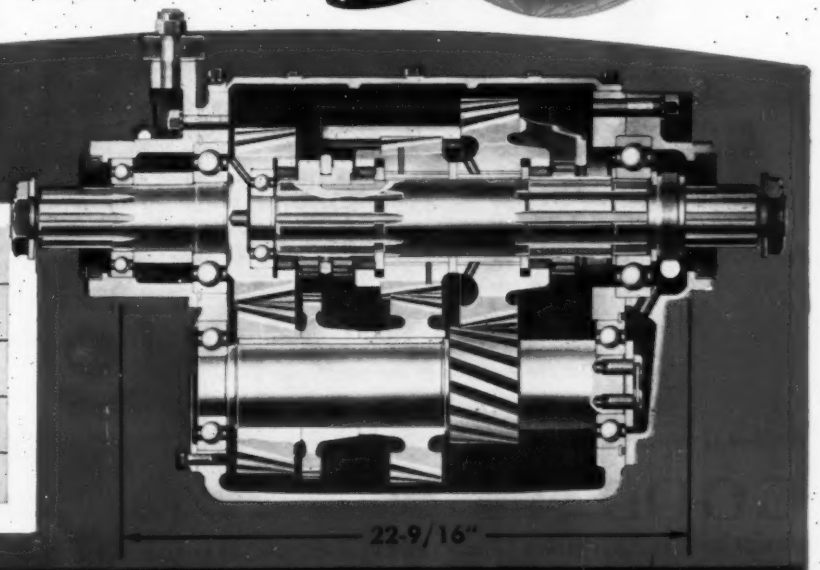
offer maximum flexibility both on and off-highway where the deep reduction is required for extreme grades and soft footing, and where splitting efficiency is required for traffic conditions.

Longer Equipment Life

With engines working in the most efficient torque and horsepower range, there is less lugging . . . less wear . . . and greater fuel economy. Result: lower maintenance costs, less downtime, longer engine and transmission life.

Fuller TRANSMISSIONS ®

Model 3-A-92
Weight—350 lbs.



3-G-92	3-H-92
Ratio	Ratio
1.00	1.00
1.327	1.327
2.09	2.64

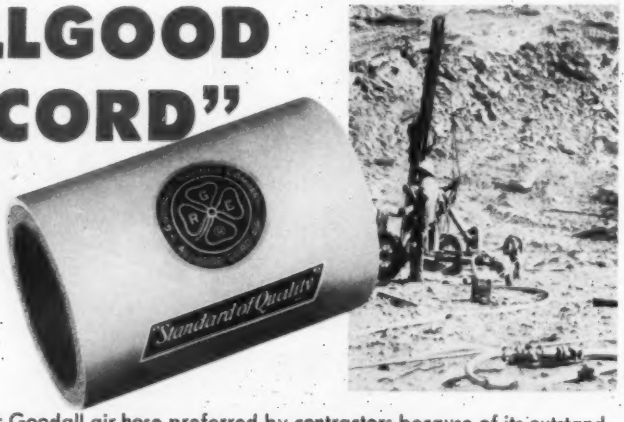
Company) *Transmission Division* · KALAMAZOO 13F, MICHIGAN · U.S.A.

USE *This* TEAM TO KEEP THE JOB *Going!*

"SUBWAY"

The air hose that resists every service hazard *longer* in the roughest rock drilling operations. Built to assure uninterrupted delivery of maximum air power, its specifications include oilproof black rubber tube; highest quality wrapped duck carcass; and wear-and-weather-resistant red rubber cover. Light in weight, very flexible, easy to handle. Sizes ½" to 1¼", in maximum lengths of 50 feet.

"ALLGOOD CORD"



Another Goodall air hose preferred by contractors because of its outstanding reliability and safety for field and jumbo manifolds where a failure would shut down not one but a number of drills. Also used for supply lines to caissons and tunnel heading shovels. Tube, carcass and cover combine to form a super-strong hose that is virtually kinkproof and offers highest resistance to continuous pressure, abrasive wear and rough handling. Sizes 1½" to 4", in maximum lengths of 50 feet.

"If it's GOODALL, it MUST be Good!"

Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES. IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

CONSTRUCTION BUSINESS . . .
continued

Civil Aeronautics Authority reports that local sponsors had $293.4 million available or anticipated for fiscal 1959 airport development projects. This was more than four times the federal matching funds allocated. About two-thirds of the total was obtained or was expected to be obtained by selling revenue bonds.

Until this financing problem and the future role of the federal government in aiding airport construction are decided, the growth of airport construction contracts will be slowed. But growth won't be stopped. The pressures are too great. And there's that $590 million in hand—enough to keep contracts moving at a high rate for two or three more years.

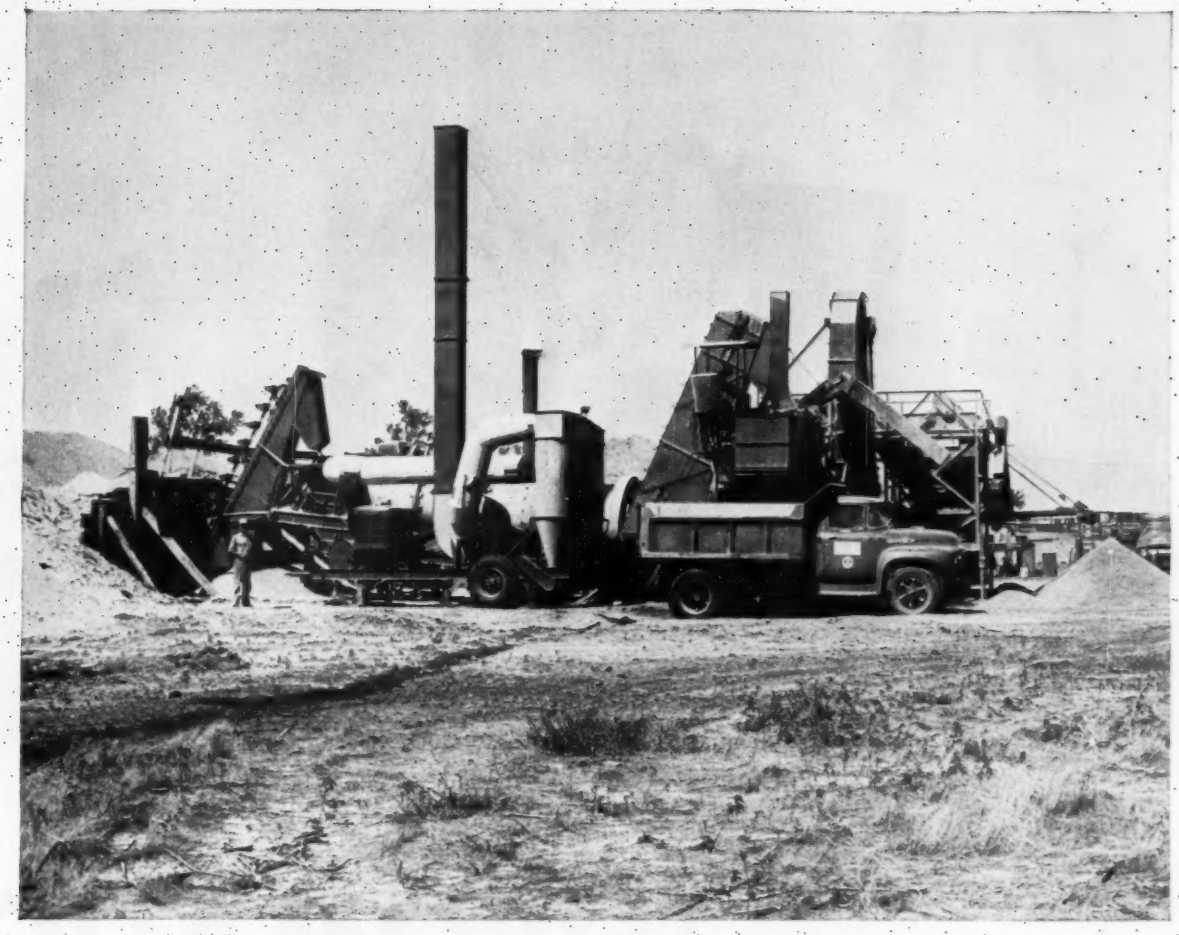
SOME BIG CONTRACT AWARDS OF THE MONTH

Henry C. Beck Builders, First National Bank Bldg., Dallas, Tex. National Animal Disease Laboratory for Dept. Agriculture, Ames, Iowa. General Services Admin., 18 and F Sts., N.W., Wash. 25, D. C. $14,331,000.

Mount Vernon Contg. Corp., 439 N. Terrance Ave., Mount Vernon, N. Y. 3.73-mi., 6-lane divided Elmsford section of Cross-Westchester Expressway in Westchester County for the New York State Dept. of Public Works, Gov. Alfred E. Smith State Office Building, Albany, N. Y. $10,609,-287.

Swinterton & Walberg Constr. Co., 200 Bush St., San Francisco, Calif. 15-story office building, San Francisco, Calif. for Bethlehem Pacific Coast Steel Corp., 20th and Illinois St., San Francisco, Calif. $10,000,000.

Robert E. McKee, Inc., 4701 San Fernando Rd., West Los Angeles, Calif. Construct Neuro-Psychiatric Institute at University of California Medical Center, Los Angeles, Calif. Regents University of California Medical Center, Los Angeles, Calif. Regents University of Calif., Admin. Bldg., 405 Hilgrade St., Los Angeles, Calif. $7,086,900.



Contractor George M. Myers reports: "Our Barber-Greene Model 845 Asphalt Plant averages 900 tons daily"*

This is the output of Mr. Myers' plant at its 21st location.

Changing job sites 21 times is a good record for any asphalt plant, but it is not unusual in a Barber-Greene Model 845. Even among Barber-Greene plants, the 845 is outstanding. It was specifically developed to achieve the utmost in portability and should not be confused with any other continuous plant. The dryer includes the hot elevator on the same chassis . . . the mixer has two-bin gradation unit included—these and other features contribute to its superior portability and performance.

Mr. Myers continues:

"We frequently move 100 miles or more . . . deliver an average of 80 tons per hour* . . . maintenance to date has been routine . . . repair minor . . . operating costs low . . . with reasonable care there should be no limit to the life of our plant."

Like all Barber-Greene Continuous Plants, the Model 845 is inherently automatic as a result of the aggregate and bitumen feed being interlocked. The human element is removed, assuring uniform mix quality.

Barber-Greene offers a complete line of both continuous and BatchOmatic plants in any capacity to suit your needs. Write for full information.

*Rated capacity is 60-90 tons per hour.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

WESTERN GOES FOR TORQMATIC

POWERED BY A PAIR OF DIESELS

—and equipped with twin TORQMATIC DRIVES—this 1LLD Euclid rear-dump takes a 50-ton load to the dam site. TORQMATIC DRIVE makes possible use of twin Diesels in this 1LLD, also makes it America's most powerful standard production truck.

WESTERN CONTRACTING CORPORATION of Sioux City, Iowa, is one of the best in the business when it comes to moving dirt on record-breaking schedules—and to meet the schedules they set for themselves, they turn to Allison TORQMATIC DRIVES every time.

Take their latest job – Oahe Dam near Pierre, South Dakota. Western's handling the big bulk of this Missouri River Valley flood control, irrigation and power project—doing most of it with 86 scrapers, trucks and tractors equipped with TORQMATIC DRIVES.

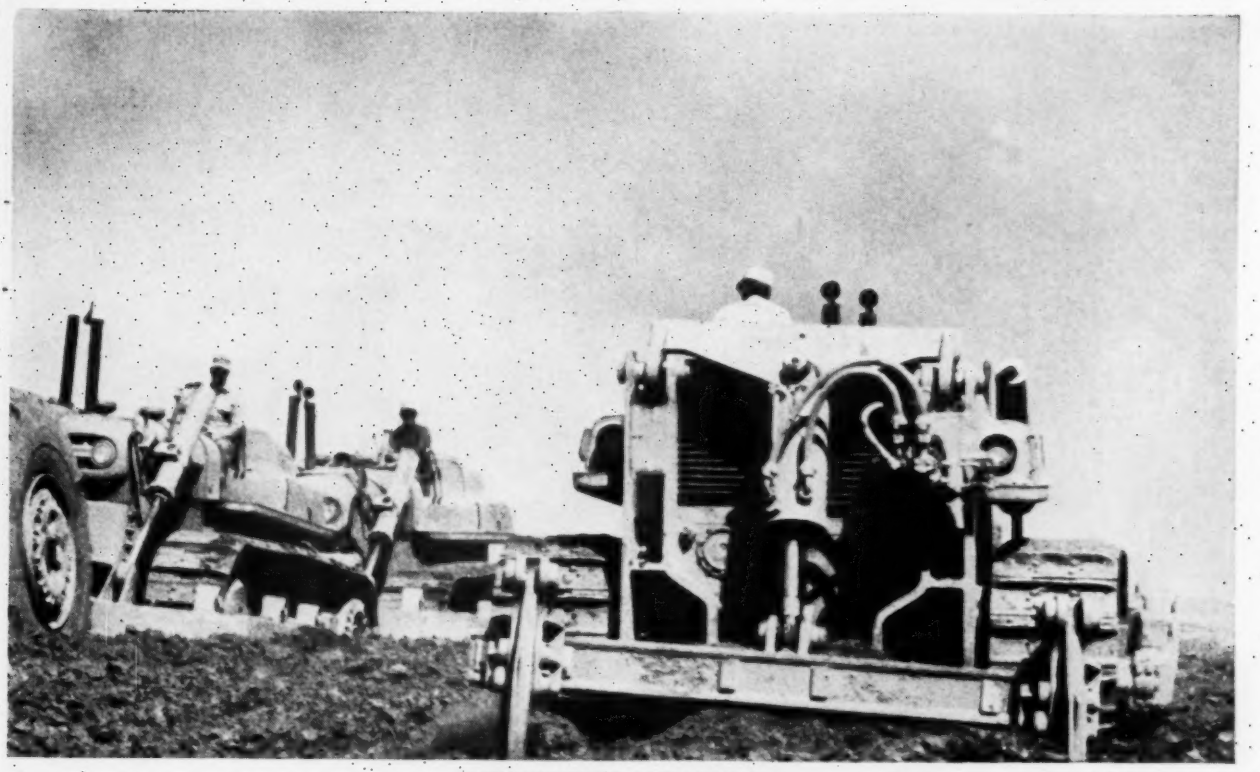
It's a big job by any measure—78,000,000 yards of earth,

PART OF FLEET EQUIPPED

with Allison TORQMATIC DRIVES working for Western Contracting.

TORQMATIC-EQUIPPED EUCLID 17-LDT

bottom-dump rolling away from Marion dragline.



1350-HORSEPOWER EARTH-MOVING
combination is this team of two Euclid TORQMATIC-equipped TC-12 tractors and a TS-24 scraper. TORQMATIC DRIVES in tractors and scraper let only 3 men control 6 engines and 1350 h.p.

to make the Oahe Dam job go faster

450 men working two ten-hour shifts six days a week, ten years for completion, a dam that will create a 376,000-acre lake with a 2350-mile shore line.

And to get that job done *on time* Western is running their TORQMATIC DRIVES almost around the clock. Euclid TC-12 twin-engine tractors team up in tandem to push-load "Euc" S-18 and TS-24 scrapers through tough-to-handle shale. Euclid 1LLD 50-ton end-dumps haul fill on split-second schedules. Euclid 17-LDT bottom-dumps haul wet earth from the spillway channel to the dam site almost every minute of the day.

How are the TORQMATIC DRIVES standing up? "Rip" Collins, Western's project manager, says no drive could do better. Only three hours a day are scheduled for equipment service—and you can't do much more than routine maintenance in that time. But the TORQMATIC DRIVES keep going day and night—and "Rip" says that "without the TORQMATIC DRIVES in these huge machines, we could never get the power we need to do this job on time."

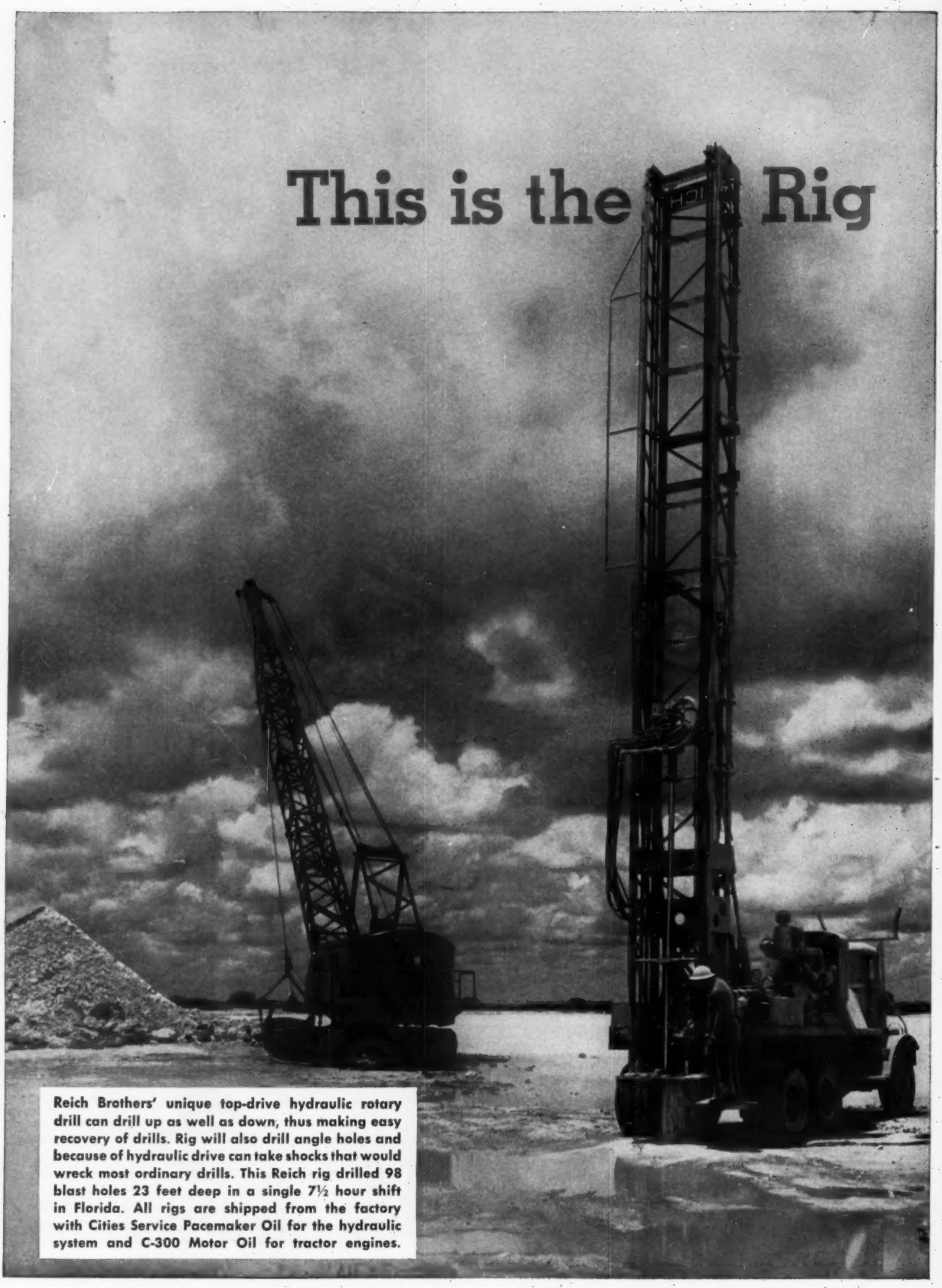
If you want to get your contracts done faster and more profitably, take a tip from thousands of construction experts—put TORQMATIC DRIVES to work for you.

ALLISON DIVISION OF GENERAL MOTORS, Indianapolis 6, Indiana

Allison ★ TORQMATIC

TORQMATIC® DRIVES

This is the Rig



Reich Brothers' unique top-drive hydraulic rotary drill can drill up as well as down, thus making easy recovery of drills. Rig will also drill angle holes and because of hydraulic drive can take shocks that would wreck most ordinary drills. This Reich rig drilled 98 blast holes 23 feet deep in a single 7½ hour shift in Florida. All rigs are shipped from the factory with Cities Service Pacemaker Oil for the hydraulic system and C-300 Motor Oil for tractor engines.

that Reich Built

...and Cities Service lubricates it!

Shortly after World War II, Reich Brothers Manufacturing Company of Terre Haute, Indiana, designed and built the first top-drive hydraulic rotary drilling machine.

With a 90 foot stroke and the ability to withstand severe shock, Reich's rig gained immediate popularity and is now in service from Michigan to Malta for mines, quarries, road construction and prospecting.

Reich realized early that extreme pressure and diverse weather conditions would place a tremendous burden on the machine's hydraulic oil and if the oil failed, so also would the rig.

Cities Service Pacemaker Oil was Reich's choice, and the wisdom of their judgment is best illustrated by the fact that there's never been a lubrication failure. One rig actually drilled 98 blast holes in a single 7½ hour shift!

Again, for the engines of the trucks and tractors on which the drills are mounted, Reich found that Cities Service has the most suitable lubricant. All units leave the factory with Cities Service C-300 Motor Oil in the crankcase . . . ready for the most rugged duty.

If you're looking for oils and greases that can take it—if, like Reich, your reputation depends upon flawless performance—you'll find the answer in Cities Service lubricants. Talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

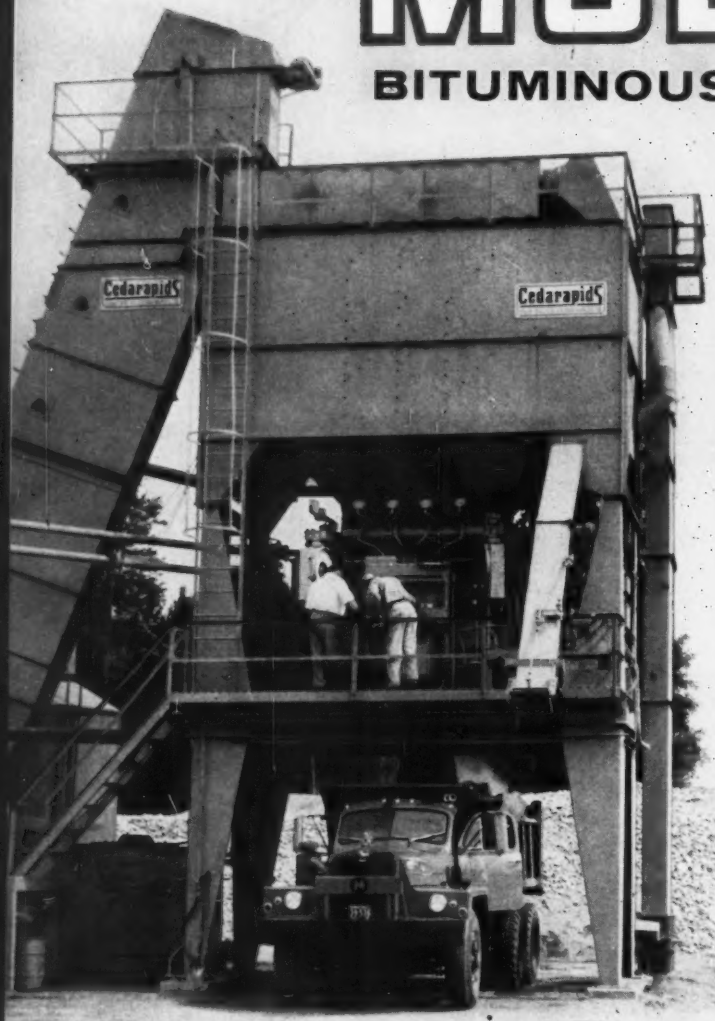
Reich Builds Its Rigs to Take It! ...uses Cities Service Pacemaker Hydraulic Oil and other Cities Service lubricants for the same reason. "Under extreme weather and load conditions, they give consistently outstanding performance," says Reich.

. . . to reduce hot-mix production costs still more!

Cedarapids announces a new line of

MODEL H

BITUMINOUS MIXING PLANTS



LOW INITIAL COST When 100% portability is unnecessary in your operations, a Cedarapids Model H Bituminous Mixing Plant is your best bet. These stack-up, batch-type plants are designed without running gear or self-erecting equipment to lower your initial investment and reduce maintenance.

SAME ADVANTAGES OF MODEL G PLANTS Except for portability, Model H Plants give you the same efficient features you'll find on Cedarapids Model G plants . . . high capacity (up to 200 tons per hour or more); all-automatic operation on the three larger models; maximum flexibility for meeting a wide range of specifications; rugged, low-maintenance design and construction.

MEETS EXACTING SPECIFICATIONS New Models H 60, H 50, and H 40 weigh, batch, mix, discharge and start a new cycle *automatically*, and the finished product of each cycle conforms to the most exacting specifications without variation. On Models H 20 and H 15, simple manual controls assure accurate weighing to meet strict specifications.

DESIGNED FOR PERMANENT OR SEMI-PERMANENT OPERATIONS Sectionalized units of Model H Plants can be quickly stacked up by crane for stationary installation. When necessary to move, the sectionalized units are easily transported by low-bed trailer.

FIVE SIZES to meet your volume demands

MODEL H 60	up to 7500-lb. batches* CAPACITY: 200 *plus* TPH
MODEL H 50	up to 5000-lb. batches* CAPACITY: 150 to 180 TPH
MODEL H 40	up to 4000-lb. batches* CAPACITY: 120 to 150 TPH
MODEL H 20	up to 2000-lb. batches* CAPACITY: 60 to 80 TPH
MODEL H 15	up to 1500-lb. batches* CAPACITY: 45 to 60 TPH

* depending upon weight of aggregate, drying conditions and job specifications.

■ You can't beat any Cedarapids Bituminous Mixing Plant for economical, profitable operation! But now, in keeping with the Cedarapids policy of offering *every* producer the kind of plant he needs to get the good contracts with low bids, Cedarapids offers a new, complete line of lower cost asphalt plants. The new Model H series plants retain all the efficient production features of the popular G 60 and G 40 models, yet reduce your initial investment to cut over-all production costs to rock-bottom levels. If your bituminous mixing operations call for permanent or semi-permanent installation, be sure to investigate the profit advantages of new Model H Plants. Ask your Cedarapid Dealer for details today.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Cedarapids
Built by IOWA

Ad No. 458-N

Tractor Lowers Rip Rap Truck

PICTURE OF THE MONTH

• High over South Dakota plains, a Caterpillar tractor lowers a truck load of rip rap down the slope of an embankment that will serve as an approach for the new Forest City highway bridge near Mobridge. On reaching bottom, the truck dumps its load of rock. An Insley crane that the contractor has mounted on a platform spots the rock along the base of the embankment, fill for which was dredged out of nearby Missouri River. The tractor then hauls the truck up the embankment where it will be reloaded. Job is part of $20-million in relocation work being carried on in the area of Oahe Dam under the supervision of the Corps of Engineers.

You pick the job—drilling post holes for electrical transmission lines, on-the-spot maintenance, or pickup and delivery of men and materials—there's an INTERNATIONAL ready to help complete it quicker at least cost. Conventional or compact-design with three or six-man cab options. Dump, flatbed, stake, or specialized bodies, on single rear-axle chassis with GVW up to 34,000 lbs., to meet any requirement anywhere.

One truck has to lead the way in any construction operation . . . and here's the truck to do it. This husky INTERNATIONAL four-wheel-drive model is all-truck engineered to hustle men and up to a ton load to the job site with true short-stroke power and economy. What's more, with its exclusive INTERNATIONAL cab mounting and suspension system, the ride is smoother and easier whether you're tracking down the highway or off the road.

INTERNATIONAL TRUCKS

You name it... You've got it!

from the world's most complete line of construction and road-building trucks

Where punishment is measured by the ton, you'll find an INTERNATIONAL like this model VF-212 taking more than its share. Within a full range of six-wheelers, you can choose a truck built to handle up to 90,000 lbs. GCW. Six-cylinder or V-8 gasoline or LPG engines, or diesels up to 335 hp. team up with extra-heavy-duty axles to *keep* big loads moving.

Need a dump truck in time to work on your present construction job?

Compact-design and conventional models ranging from 19,000 to 38,000 lbs. GVW, with up to eight-yard bodies, are ready for *immediate delivery* now from the INTERNATIONAL Truck Factory Inventory Pool. Call your INTERNATIONAL Dealer for details, today!

cost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick®
Farm Equipment and Farmall® Tractors

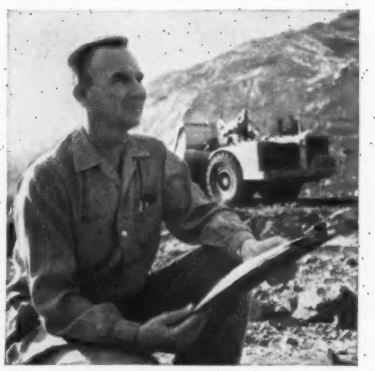
ENGINEER'S FIELD REPORT

PRODUCT **RPM DELO OIL**

FIRM **Silva & Hill Construction Co.**
Los Angeles, Calif.

5,000 hours at 2,000 rpm before overhaul

Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before major overhaul. Says Maint. Supt. H. C. Basinger: "We've got 39 diesel-powered machines working to beat a one-year deadline. Any unexpected delay costs plenty. That's why we stick with 'DELO'. It's proved it will keep equipment rolling longer without engine breakdowns or repairs."



Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."

LUBRICATING OILS RPM DELO

TRADEMARKS "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20
THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

Why RPM DELO Oils reduce wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.

For More Information

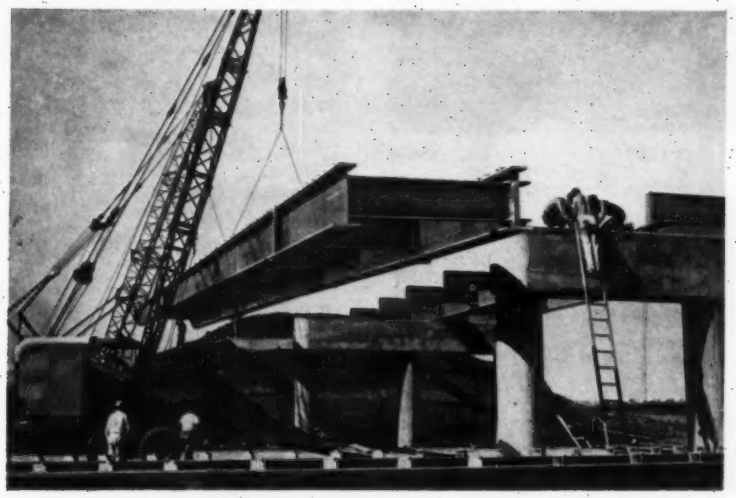
or the name of your nearest distributor, write or call any of the companies below.

STANDARD OIL COMPANY OF TEXAS, El Paso
THE CALIFORNIA COMPANY, Denver 1, Colorado

Construction News in Pictures . . .

Topping Out

A gold bolt joined last steel topping out the structural skeleton of Detroit's huge convention hall and exhibit building located on the banks of the Detroit River. R. C. Mahon Co., steel fabricator and erector, transported huge members through city streets in dead of night on tight schedule to complete job 90 days ahead of time.



Aluminum Bridge

Crane lowers sub assembly of aluminum structural girders into place on a highway bridge near Des Moines, Ia. The 222-ft span is the first aluminum girder type highway bridge in the world. It was developed by the Iowa State Highway Commission and top aluminum producers to demonstrate aluminum's structural qualities.

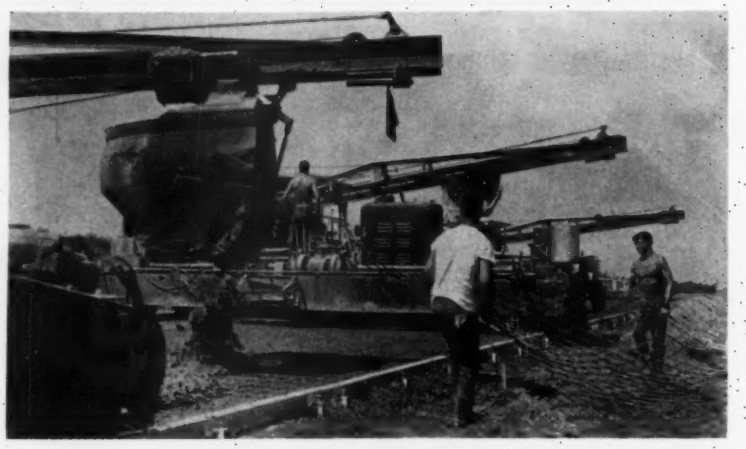
A Long Stretch

Nine flights of rubber conveyor belting extend more than two miles down a mountainside to Trinity Dam in Northern California. The 42-in.-wide belting made by B. F. Goodrich for the next three years will haul 30,000,000 tons of selected clay and gravel fill for the record size earth dam at a rapid rate.

continued on next page

Fast Going

Paving crews place a record day's work for Denton Construction Co. of Detroit on a 9-mi stretch of U.S. 23 in Dundee, Mich. Three Rex pavers powered by GM diesels set the pace on the $3.1-million job where crews put down 6,029 ft of 9-in. concrete paving 24 ft wide in a 12½-hr period. Denton's previous best for a day was 5,787 ft.



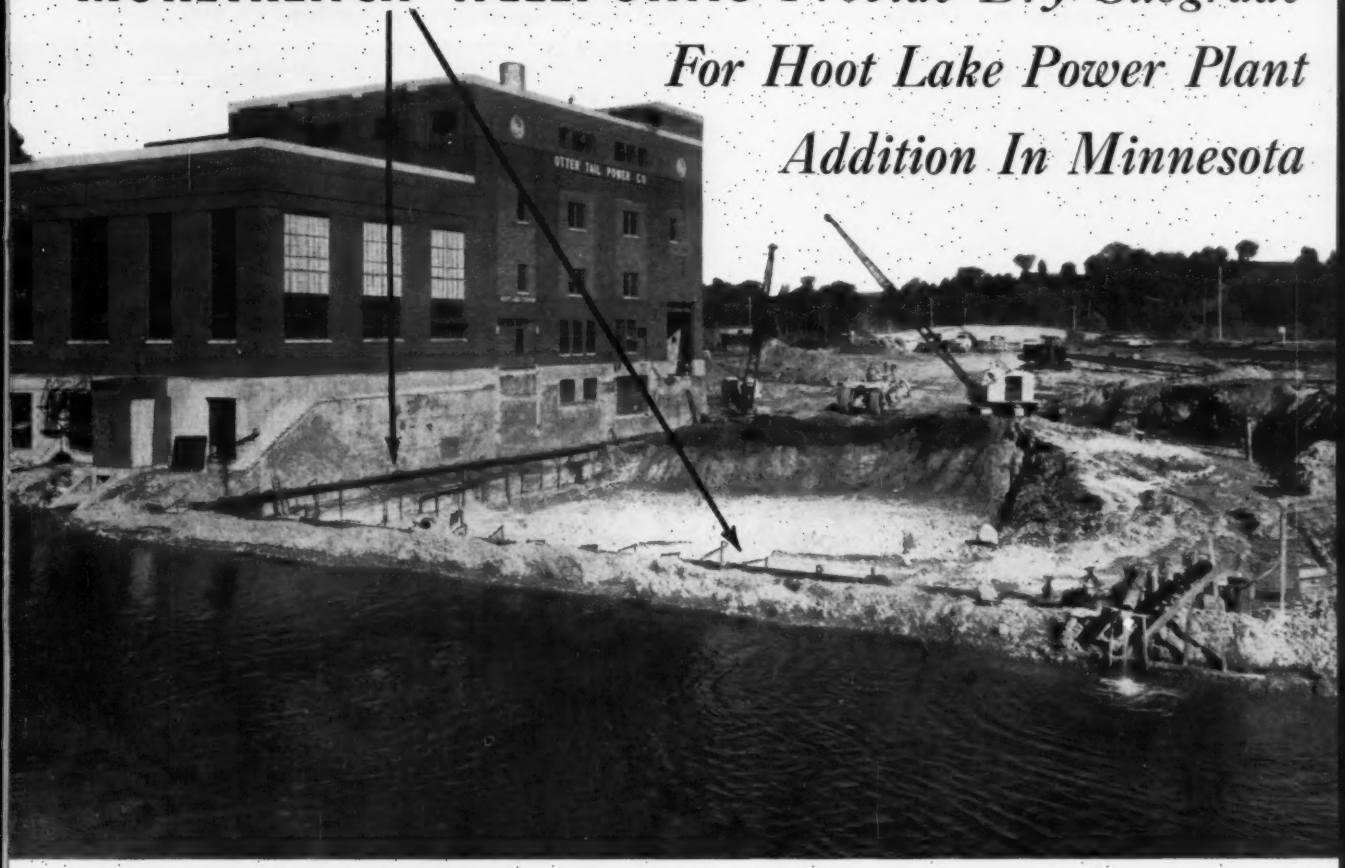
Handling Precast Beams

A huge Manitowoc 3900 crane mounted on crawlers sets a precast concrete deck beam into place on the Franklin Street Bridge in Houston, Tex. Elmer Gardner, Inc., the contractor, also uses the 60-ton crane to pour concrete, drive sheet piling, and excavate a channel under the 200-ft bridge. The job will be completed this month.

Steel Rides High

Trestle-riding derricks 135 ft in the air place Bethlehem steel stringers for a 4,000-ft span that will carry the 24-mi Bershire section of the N. Y. Thruway across Hudson River between Castleton and Selkirk, N. Y. Harris Structural Steel Corp. is erecting the steel for the $16-million structure scheduled for completion this year.

MORETRENCH WELLPOINTS *Provide Dry Subgrade For Hoot Lake Power Plant Addition In Minnesota*



Owner: Otter Tail Power Co., Fergus Falls, Minnesota
Engineers: Burns & Roe, Inc., New York, N. Y.
Contractor: T. F. Powers Construction Co., Fargo, No. Dakota

To insure a safe, dry foundation for a 53,500 KW addition to the Hoot Lake Station Power Plant near Fergus Falls, Minnesota, Moretrench Wellpoints pulled the water level down 12'.

Material consisted of gravel and boulders on the river side, fill next to the existing structure, silty sand and clay on the remaining two sides.

Twenty-four hours after pumping started, the contractor was excavating in the dry. He writes us that the operation of the wellpoint equipment "surpassed expectations".

Expect the *BEST* when you predrain with Moretrench! Ask us anytime for our ideas on how you can work profitably "in the dry".

Catalog on request.

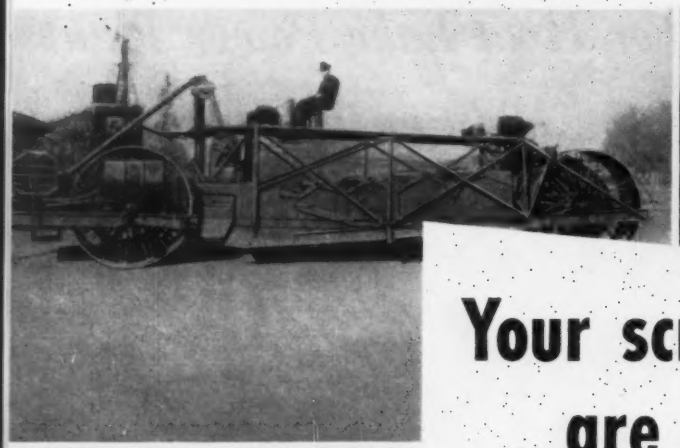
MORETRENCH CORPORATION

90 West St.	4900 S. Austin Ave.	7701 Interbay Blvd.	315 W. 25th St.	Rockaway
New York 6	Chicago 38, Illinois	Tampa 9, Florida	Houston 8, Texas	New Jersey
CO 7-2283	Portsmouth 7-4212	Tampa 61-1881	Underwood 4-7774	Oakwood 7-2100

Western Representative: Andrews Machinery of Washington, Inc., Seattle 4, Washington
Canadian Representative: Geo. W. CROTHERS Limited, Toronto, Ontario
Brazilian Representative: Oscar Taves & Co., Ltd., Rio de Janeiro

Earthmoving's first self-propelled scraper . . . with steel wheels, 5 telescoping buckets, and 7 electric motors. This 1923 model was positive-dumping, moved 6 yd at a time, and traveled at about 1 mph.

In 1932, the first rubber-tired scraper. This model was equipped with rubber tires for better production in sand . . . worked so well it opened a new era of speed and mobility in the industry.



Your scrapers are as OBSOLETE as these

An "all time great" in earthmoving: the Super C. World War II vintage, but hundreds are still in use. Yours can do one more big job for you: they can serve as trade-ins on new, big-production Fullpaks.

An old drawn scraper, another favorite among dirtmovers. But compare it to the self-propelled "D", that can be driven job-to-job, and do a dozen earthmoving jobs fast, economically.

EQUIPMENT doesn't have to be *worn out* to be obsolete. A rig in *perfect* condition can be as out-of-date as the four antiques shown directly above. That's because the main difference between equipment of yesterday and today is *production-ability:* being able to move *more* dirt, *faster,* at *less* cost.

A few years ago, almost any production-pace was profitable. Bid prices were about what they are now, and operating costs were much less. A slow-moving "crawler-and-pan" handled most jobs . . . and a then "modern" machine like the Super C Tournapull® was a *real* money-maker. But that was years ago!

Since then, all your costs have skyrocketed . . . but bid prices haven't. Result: there's much less net profit *per yard moved.* To keep profits *up,* nowadays, you've got to move *more* yards per rig . . . and to do so, you need all you can get in both speed and capacity.

Trade up to profit!

That's why it will pay you to retire old veterans in your equipment spread. Though they may be "written off" your books, they may actually cost you more . . . *in production you need but don't get* . . . than it would cost you to own and operate new tools you can now "trade up to." Today's bigger, more powerful, high speed machines let you finish jobs earlier and make more profit. They also protect you with a wider margin of production capacity against delays and extra costs due to abnormally bad weather and other hidden hazards of dirtmoving.

"Cheap" yards not always cheap!

When you're working a rig that's "depreciated to zero" on your books, your ownership-operating costs for that machine are less, of course, than they'd be with new equipment. But that doesn't mean your earnings . . . or profits . . . are better!

Time-weight-and-cost tests of Super C's against C Fullpaks® prove that the *extra* yards you move with Fullpaks more than *make up* for this lower operating-ownership cost. Here's what cold mathematics can prove on a given set of job conditions:

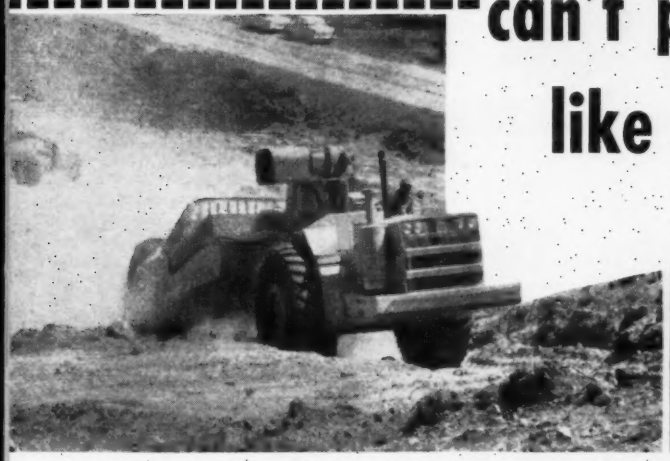
1) The Super C can move 105 yd an hour, with operating costs of $8.40 per hour . . . or 8¢ a yard. If the bid price is, say, 25¢ a yard, gross earnings per hour will be $26.25. Subtracting operating costs (with zero ownership cost) means the unit produces earnings of $17.85 an hour.

2) On the same job, a C Fullpak can move 140 yd an hour. Combined ownership and operating costs are $11.92 . . . $3.52 more than those of the Super C. Per yard cost, at 8.5¢, is 5 tenths of a cent higher. But, at the low 25¢ a yard, the Fullpak still earns $35.00 "gross" per hour, with $23.08 "net" . . . $5.23 more than the Super C. Working 1,500-hr seasons? If so, your bonus, at this rate, would be $7,845 per Fullpak!

Combine of Schultz, Lindsay, Tennefos moved as much as 75,000 yd a day on relocation of US 10 in North Dakota. Scrapers, mostly Fullpaks, including 12 "C's", 8 "B's", often loaded in just 22 seconds!

"Power-transfer differential saved the day," reports Contractor Bob Walker, Franktown, Colo. Of 3 makes of scrapers on recent "mud job", only 'Pulls could climb slippery banks on haul-route without pusher help.

if they can't produce like this!



20 pay-yards of 3,000-lb dirt in 47 seconds was average for Hammersley Const. Co.'s B Fullpaks moving this 100' hill from path of highways 57-32 in Wisconsin. Firm also used "C's" for cutting and ditching.

"Finish a job faster, at less cost, than any other earthmover," says Wm. S. Howard, Rockford, of B and C Fullpaks he used on wet, muddy section of Illinois Toll Road. Of "B" he says: "THERE is a production scraper!"

LET us show you weighed-load production records on LeTourneau-Westinghouse Tournapulls with Fullpak scrapers. In their size ranges, the 18-yd "C" and 28-yd "B" move more pay dirt per load, more payloads per hour. Here's how they do it:

Fullpak bowl is lower . . . wider

Proven faster-loading on jobs around the world, Fullpak scraper bowls are *low:* dirt doesn't have to be lifted as high, nor moved through already packed load. Bowls are *wide;* to provide the biggest possible doorway for dirt. Inside the bowl, earth flows easily, freely, with uniform pressure in all directions. You get fewer voids, a uniform pack, a higher heap, full corners, all in less time per load.

'Pulls* work longer, steadier . . . with fewer, lower maintenance bills. Durability features include: all-welded box beams of heat-treated steel; anti-friction bearings for all high-speed shafts; gearing completely enclosed in oil; and earthmoving's simplest, easiest-to-maintain power system: "electrics."

Electric controls boost production

Instant electric response is another one of the reasons that these modern Tournapulls boost production. *In a split-second,* electric motors reach full speed, to operate apron, tailgate, bowl-hoist, and steer. "Push-button" operators learn faster, work faster.

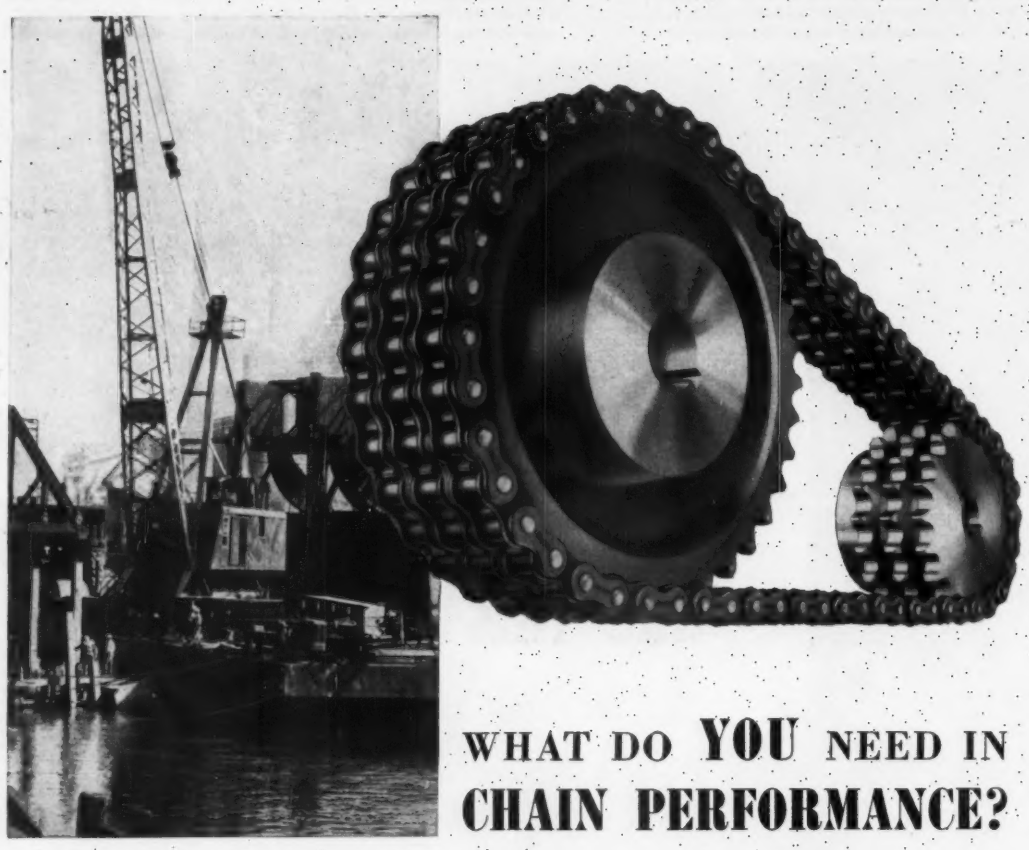
Another L-W "exclusive" that boosts yardage is the patented power-transfer differential. When one 'Pull drive wheel starts to spin in soft going, its torque power is *automatically* and *immediately* transferred to the wheel on better footing. This differential, plus Tournapull's 90° kingpin electric steer (for "duck-walking") will *keep you moving* in *any* dirtmoving weather.

See for yourself. . . .

Check our claims. Ask your LeTourneau-Westinghouse Distributor to show you a working demonstration of the 'Pull of your size need. Compare what you see in that demonstration against *any* other scraper on the market. When you're ready to "talk turkey" you will find you'll get a fair deal on those Super C's or other obsolete rigs that are no longer profit-makers on today's big yardage dirt production.

*Trademark CP-1966-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

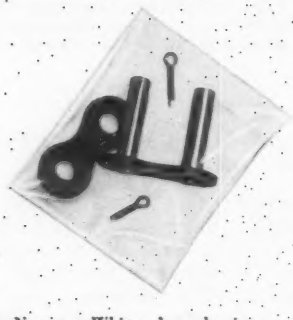


WHAT DO YOU NEED IN CHAIN PERFORMANCE?

What you *need*, you *get* in Whitney's new, *fatigue-resistant* Processed Roller Chain.

This new development in heavy duty chain is keeping construction on schedule profitably . . . establishing new service records on leading construction equipment. You get this kind of performance from the exclusive Whitney Process which *offsets* excessive operational stresses in the chain. This means ruggedness to spare—the ability to *withstand heavy shock loads* under the severest operating conditions.

Still another important design advance is Whitney's High-Capacity Roller Chain. If limited space or weight are serious factors in power transmission, this new, *compact* chain drive may provide a solution. Factory trained field engineers are always available for practical recommendations on all of your chain and sprocket design problems. And you can rely on your nearby Whitney Chain distributor for fast off-the-shelf service from his complete line of ASA roller chains, conveyor chains and stock sprockets.



New . . . Whitney's packaging includes plastic enclosed disassembled chain parts for easy chain assembly, handling and parts inventory . . . Another exclusive Whitney service!

Whitney
CHAIN COMPANY

315AJ Hamilton St., Hartford 2, Conn.

ROLLER CHAIN • CONVEYOR CHAIN • SPROCKETS • FLEXIBLE COUPLINGS • WHITNEY-TORMAC DRIVES

At Blackstone River Flood Control Project

wet footing, narrow cuts fail to slow down L-W haulers

To greatly reduce the threat of floods — with its inevitable loss of life and property — the U. S. Corps of Engineers is constructing numerous flood control projects on our rivers. One of these is the Blackstone River project at Woonsocket, R. I.

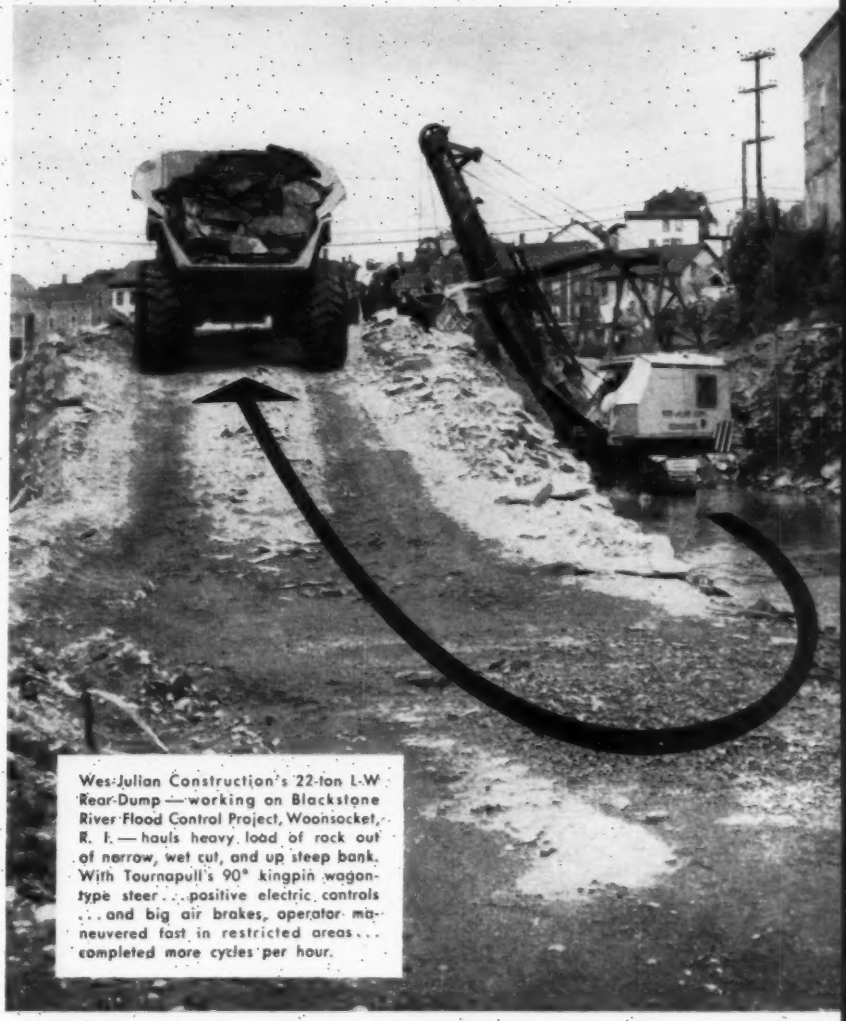
Wes-Julian Construction Corporation of Dedham, Mass., contracted to handle 2 phases of this job. One is to build a dam; the other is to deepen, widen, and straighten the river. To complete the latter job, the firm is moving 500,000 yd of earth and rock. Included in contractor's high-speed earthmoving fleet are 2 LeTourneau-Westinghouse C Tournapulls® with 22-ton Rear-Dumps, 2 L-W tractor-drawn 18-yd scrapers, and a 210-hp rubber-tired Tournatractor®.

Short turns speed cycles

To straighten the river, it was necessary to cut a channel through hard rock. Working in this wet, narrow area, 210-hp L-W Rear-Dumps' short-turn radius came in mighty handy. (In haul position, unit makes continuous 180° turn in 28'8" . . . in dump position, it turns in only 20'8".) This unique maneuverability enabled operator to spot fast under dipper . . . to work safely, easily. Also, the L-W haulers' power-transfer differential kept drive wheels from slipping on the slick, rocky footing . . . ensuring traction for steady, profitable hauling.

You'll find — as did Wes-Julian Construction Company — that LeTourneau-Westinghouse Rear-Dumps haul steadily in poor footing and in narrow or congested work areas. Let us give you the whole story on these high-production, pivot-steer haulers. Available in 3 sizes: 11, 22, and 35 tons. Call or write for demonstration.

CR-1926-DCJ-1



Wes-Julian Construction's 22-ton L-W Rear-Dump — working on Blackstone River Flood Control Project, Woonsocket, R. I. — hauls heavy load of rock out of narrow, wet cut, and up steep bank. With Tournapull's 90° kingpin wagon-type steer . . . positive electric controls . . . and big air brakes, operator maneuvered fast in restricted areas . . . completed more cycles per hour.

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

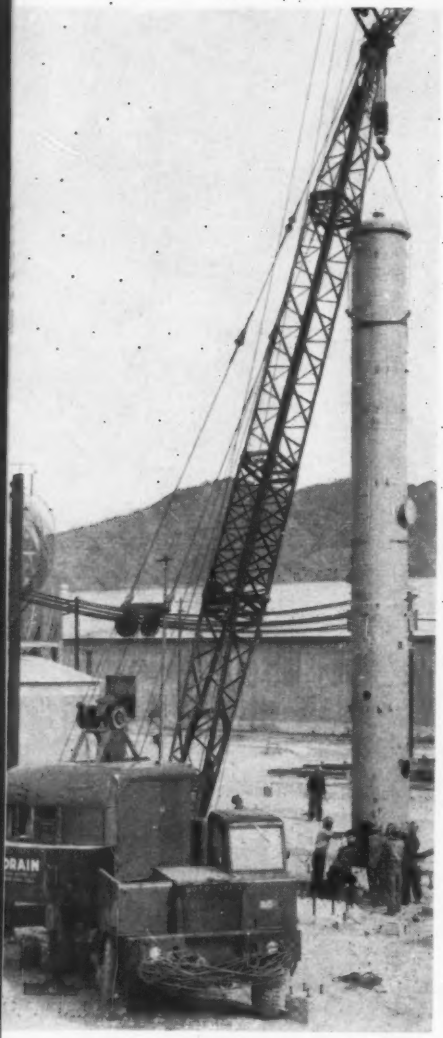
A Subsidiary of Westinghouse Air Brake Company

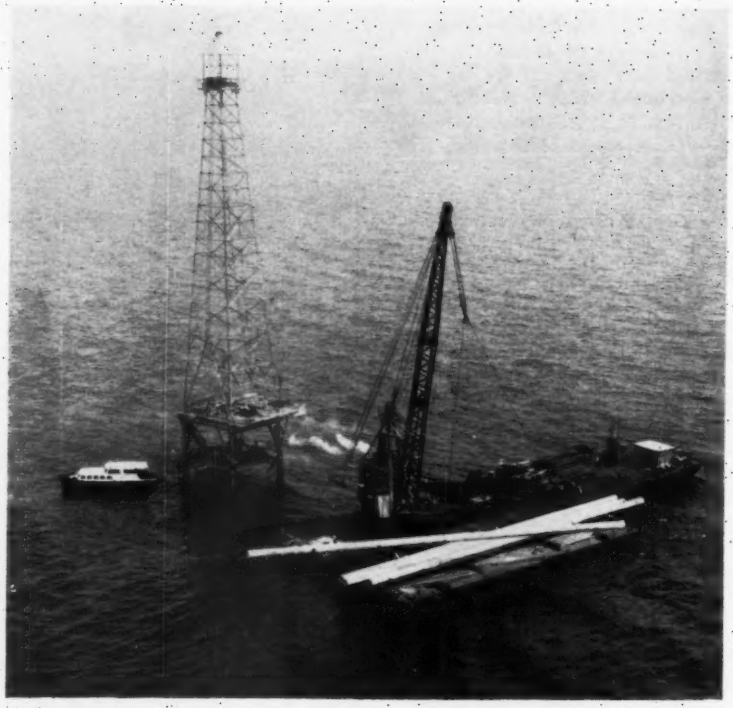
Where quality is a habit

Construction 'Round the World . . .

In Pakistan

Fleet of Euclid 15 and 22-ton rear dump trucks move earth and rock for a rock fill dam 240 ft high and 750 ft long under construction on the Kabul River. Dam will provide water storage capacity of 20,000 ft. The trucks, owned by contractor Angus Robertson, Ltd., of Montreal, Can., are British built and powered by Rolls Royce diesel engines.





In Korea

A big Lorain Moto Crane places heavy steel stripper and scrubber vessel for a urea fertilizer plant at Chung-Ju; 60 mi south of the border being guarded by U.N. troops. McGraw-Hydrocarbon, a combine of F. H. McGraw & Co. and Hydrocarbon Research, Inc., designed and is building the structure as a U.S. foreign aid project.

In Venezuela

Derrick boat lifts 144-ft prestressed concrete pile that will be driven into bottom of Lake Maracaibo to form a foundation for an extension to oil-drilling base (left). Raymond-Brown & Root, a combine of Raymond International and Brown & Root, Inc., casts the piles on shore then barges them out to the derrick that drives them.

Milwaukee contractor moves a lake

Grading the site for a new subdivision proved to be an interesting and challenging project for contractor Don L. Hintz, Milwaukee, Wisconsin. In addition to "routine" street construction and general grading, Hintz had the unusual assignment of *moving a lake.*

On the 92-acre site of "Brantwood Estates" in suburban Glendale (near Milwaukee), there were three small lakes. These had been formed by underground water gathering in excavations of a sand-pit previously operated there.

3 "D's" handle major yardage

Developers Atkins and Wahlberg, Inc., employed Don Hintz to grade the subdivision and fill two lakes. The third lake was moved about 200′ — by cutting one side, filling the other — then enlarged to 8-acre size, and surrounded by luxurious home sites. The work, including approximately 2 miles of roadway, totaled 108,000 cu. yds. — mostly blue clay, silt-sand, and some gravel.

Hintz brought in a new, 9-yd. LeTourneau-Westinghouse D Tournapull®, and 2 older D 'Pulls*, along with a crawler-scraper, 2 tractors, 2 graders, and a 1½-yd. dragline. The dragline removed muck and cut drainage around the 3 lakes. "D's" handled the bulk of earthmoving.

Spread native sand on shoreline

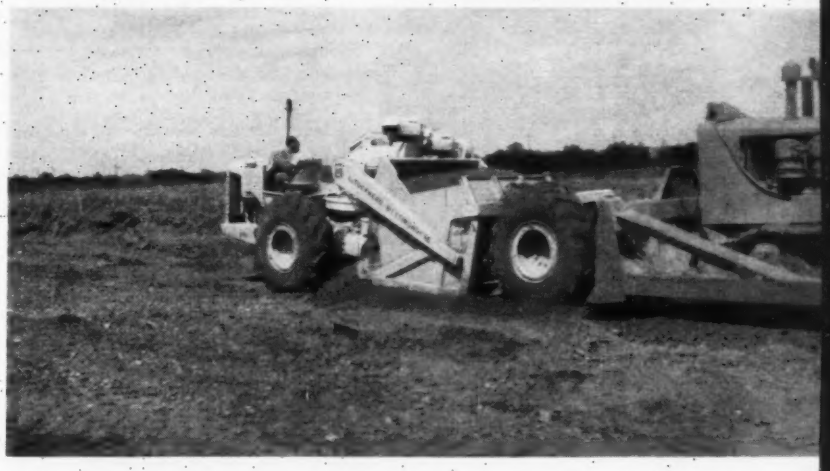
Photos show the work at 2 different stages. In Operation 1, D Tournapulls dug along side of old lake to form a larger new lake . . . then hauled dirt to fill a former sand-pit. After the new lake was excavated, shoreline was covered with sand. In Operation 2, 'Pulls cut a street across the side of a slope. Machines hauled down-hill and filled low lots.

"D" operator, Joseph Curasi, reports, "I like Tournapull's electric controls best, especially the easy steering. In some of this silt-sand, it's only the electric steering and non-spin differential that gets us thru. We'd be stuck if we couldn't 'walk' them out (by turning prime-mover 90° right, left, right, etc., while applying forward drive power)."

Operation 1 — Cutting new lake area

	Dist.	Time
Load	95′	43 seconds
Haul	200′	31 seconds
Spread	80′	32 seconds
Return	240′	38 seconds
Cycle	615′	2 min. 24 sec.

Material: blue clay, silt-sand — Roads: bumpy, rutted, soft



Operation 2 — Grading streets

	Dist.	Time
Load	75′	39 seconds
Haul	935′	not recorded
Spread	50′	not recorded
Return	1010′	not recorded
Cycle	2070′	3 min. 41 sec.

Material: gravel and sand — Roads: fairly smooth, firm

"Couldn't want a better machine"

Owner Don Hintz says, "You gotta take your hat off to these 'D's' . . . they really move the dirt fast! Even in early spring you'll find us working. That's because we can start earlier than others. In a year's time we move plenty of dirt . . . we couldn't want a better machine."

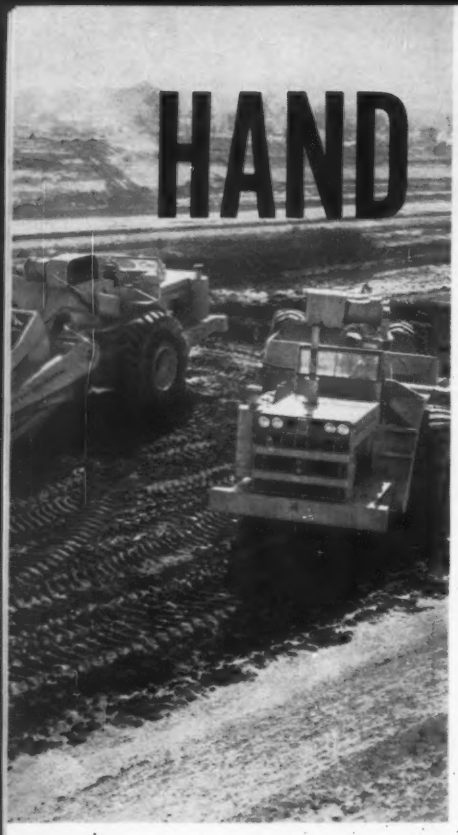
You'll find Don's appraisal of Tournapulls is right . . . you couldn't want a more efficient, and profitable scraper. Ask us to demonstrate. 9, 18, 27-yd. sizes. Call or write us.

*Trademark DP-1766-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



HAND SIGNALS

"Sign language" communications to help direct earthmoving equipment

The proper use of hand signals — between foremen and equipment operators — can eliminate many work interruptions that steal pay-yards from your production schedule. This system of communication permits conveying *emergency changes*, or *additions*, or *clarifications* of the verbal instructions given prior to an operation — at a distance, and above the roar of the big engines used on earthmoving equipment.

No matter where your foreman is on the cut, haul, or fill — if he is in visual range of the operator, and if standard signals are used and understood — he can signal the operator through the use of his hands, arms, and feet. The operator acknowledges he has received a signal by raising and waving his hand.

Here are the best-known, most widely used hand signals. They can help you increase safety, production, and profits.

1. The most commonly used signal in dirtmoving is for location and depth of cut or fill. Foreman indicates spot where he desires operator to begin cut or spread by pointing . . . or by throwing a rock or clod of dirt. Fingers raised indicate depth of cut or spread, in tenths of a foot — three fingers for 3/10′, and so on.

2. To indicate number of feet in final depth of cut or fill, foreman points with an up-and-down motion to his foot . . . at the same time holding up fingers of opposite hand, to indicate number of feet. For example: A combination of pointing to foot and two fingers raised, indicates that there are two feet to cut or spread in this area.

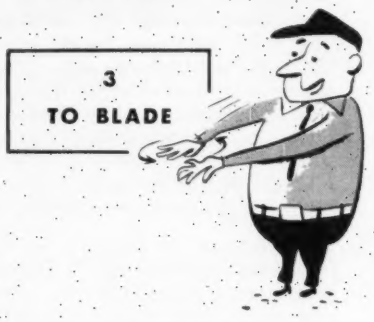
3. The signal to blade the cut, fill, or haul road, is conveyed by pointing out the area, and then rubbing the palms of the hands together horizontally . . . indicating a smoothing motion.

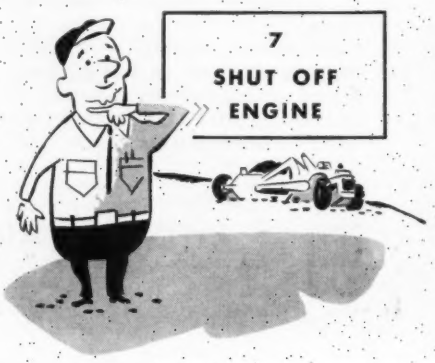
4. To hustle any operation, the signal used is to vigorously swing the raised right forearm in a circular motion.

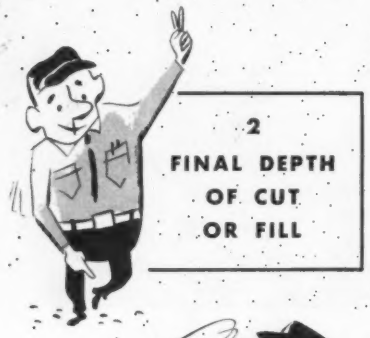
5. If there's danger ahead, operator can be signaled to stop immediately, by vigorously flapping arms vertically.

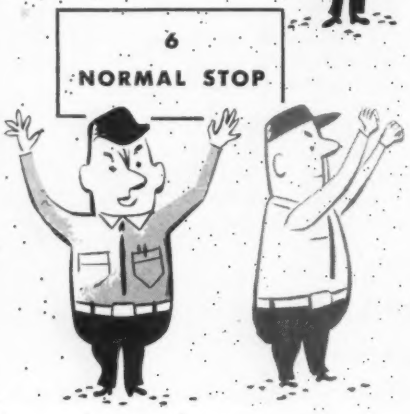
6. For normal stops or to hold up dirt-movers, both hands are raised, police wise, with palms up to the operator. To indicate that all rolling motion of the machine should stop, and brakes be held until a release signal is given, clench both fists.

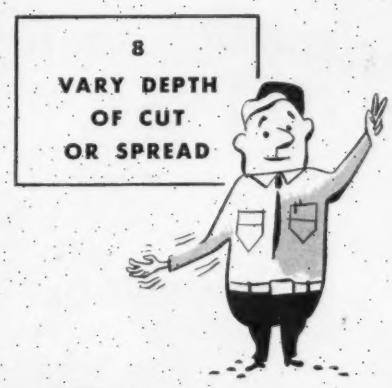
7. "Cutting your throat" is a signal which is universally understood — kill your engine.





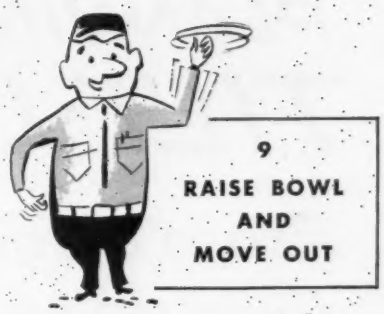




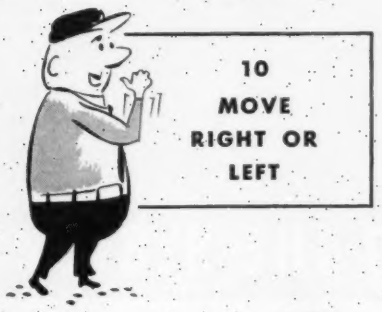


8. While making a cut or spread, it may be desirable to have the operator vary the depth. Indicate this by a lifting or lowering motion with the palm of one hand — depending on whether blade should be raised or lowered. Signals for tenths with fingers (see #1), indicate distance to raise or lower.

9. When cut approaches finished grade, and it is desirable to have the operator raise his partially-filled bowl and move out — indicated by a lifting, closing motion of the fingertips and hand. Follow immediately with the highball sign (sketch 4).

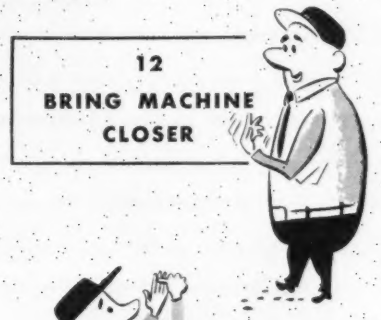


10. Should you want the scraper to move either right or left, a hitch-hiking motion with the thumb in desired direction is used.

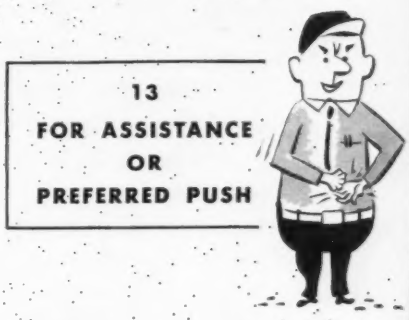


11. When machine has shifted and is to resume straight-ahead travel, indicate by extending arms (below shoulders), and with palms turned down . . . the same motion used by a baseball umpire to indicate a player is "safe".

12. To bring machine closer to the foreman, a beckoning motion with one arm and hand is used. When maneuvering in close quarters, or to move only a foot or two at a time, both hands should be used indicating a slower, more cautious approach.



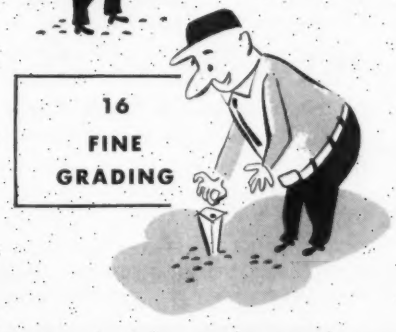
13. In case a machine becomes bogged down, and it is desired to signal another machine to assist the stuck machine, the fist of one hand is banged into palm of the other . . . then pointing to the machine to be pushed. The same signal applies to indicate that a certain specified scraper is to be push-loaded before another . . . or that the tractor or dozer is to push another piece of machinery, tree or boulder.



14. When it is desired to carry out an operation with extreme care, indicate by simply rubbing the thumb against the fingertips of other hand, and then indicating the desired motion.

15. For scarifying or ripping, the foreman can point or throw a stone at an area to be ripped, followed by a clawed hand in a digging motion.

16. Beyond hand signals, a handy trick is sometimes used by foremen on fine-grading operations. The foreman moves down the roadway ahead of the grader, checking the grade with a hand level. He then indicates the proper amount of cut, by laying a number of pebbles on the top of each stake corresponding with the tenths of foot to be cut. When he wants a cut of 2/10 foot, for example, he indicates this by laying two pebbles on the stake. This works fairly well up to a 4/10-foot cut, which in most instances covers all of the fine-grade operation.



Free reprints or large wall charts of this article on request. State quantity desired. If you know of any additional hand signals that we have not touched upon, drop us a line, describing those found to be effective on your operations.

1593-DC-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

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Where quality is a habit

PLANNING TILT-UPS?

From original layouts to final positioning...

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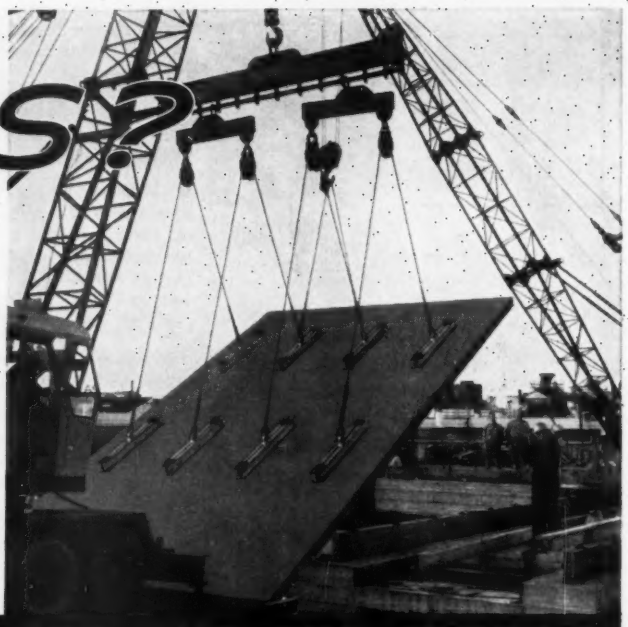
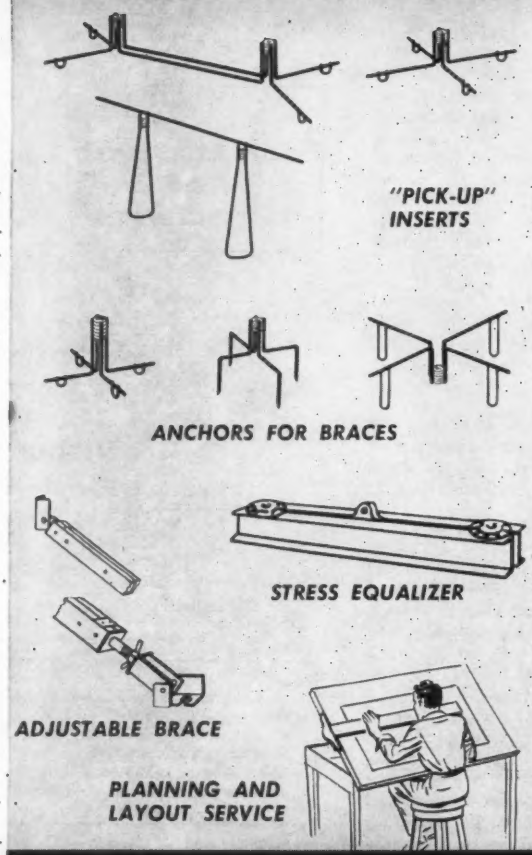


HAS THE ACCESSORIES AND THE SYSTEM



Tilt-Up jobs can be accomplished faster and with greater efficiency by using SUPERIOR Accessories (shown at left). In addition to Accessories which have been used and proven on thousands of conventional as well as unusual projects in this field, SUPERIOR also provides the *system* for the entire job, from original planning and layouts, to the final positioning of the precast panels with Superior Adjustable Braces.

As the pioneer in this field, Superior has recently developed a special Stress Equalizer for reducing lifting stress in tilt-up panels of over 20 ft. high. It offers two advantages: (1) Less concrete reinforcing steel is required for stresses which occur at time of lift; (2) Permits use of simplified crane rigging.

On your next tilt-up job, avoid expensive crane delays, be assured of safety, and reduce overall costs! Specify the SUPERIOR System.

For details request a copy of Bulletin TU-3.

(Shown above) 67,000 LB. PRECAST PANEL being positioned. 19' 6" wide by 35' high by 8" thick. Swinerton & Walberg of San Francisco is the contractor.

SUPERIOR Concrete Accessories, Inc., 9301 King St., Franklin Park, Ill.
(A Suburb of Chicago)

NEW YORK OFFICE
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PLAN '59

How Modern Is American Industry?

A Report by the McGraw-Hill Department of Economics

THE U.S.A. is starting a new period of economic growth, as we leave behind the recession of 1958. This new period presents a challenge to the nation, to the business community and above all to the individual company – to grow *at a profit*.

By now it is clear that growth is the normal way of life for the U.S. Economy. Since 1947, our national product has been growing at a rate of 3.7% a year. And no recession, even the latest and most publicized, has interrupted the trend for long. Now the economy is growing again.

But the conditions of growth are far different from those that prevailed in the years 1947 to 1957.

Today growth in the economy does not mean pressure on capacity, for most industrial firms. It does not mean easy profits. Rather, this is growth under highly competitive conditions, with profits dependent on a firm's ability to hold down costs. **Is our plant and equipment modern enough to do the job?**

A New Survey

To find the answers to this question, the McGraw-Hill Department of Economics has just completed a special survey of business needs for modernization. **The survey shows that it would cost $95 billion to replace today's obsolete equipment.** And this is a priority job, if business is to get costs down for the years ahead.

This tremendous need for modernization presents a challenge to the U.S.A. as a nation. The Communist powers are making a strong and disciplined effort to demonstrate that they can out-produce us – that they can "plow us under" in a contest of industrial strength.

It is a challenge to American business. Our people expect a continuously rising standard of living. Our workers expect wage increases. And often their demands mean price inflation – unless we can achieve sharp gains in output. The public demands higher national income without inflation. This is the challenge to business as a whole.

It is a challenge to the individual firm. Growth in the economy no longer means an automatic rise in sales and profits for any particular company. There are no shortages; industrial capacity is ample. So to participate in growth, the individual firm must achieve better quality or lower costs than its competitors. Otherwise, there will be no profit in growth and no success story for the company.

Is business prepared today for these challenges? The answer, from our study, is clearly "No". The production and distribution facilities of the U.S.A. are not efficient enough to ensure our continuing superiority over the Communist world, to match every wage increase with higher productivity, to do business in a competitive economy at satisfactory profit to the individual firm.

This statement sounds shocking at a time when much industrial capacity is idle and the recession just behind us is being blamed on a surplus of capital goods. But the facts speak for themselves. Here is the record on the past decade of investment in new plant and equipment, and here is our new study of the job that still remains to be done.

THE MODERNIZATION JOB AHEAD: $95 BILLION

The McGraw-Hill Department of Economics asked a wide sample of manufacturing companies, and experts in other industries, "What would be the cost to replace all obsolete facilities with the best new plant and equipment?" Here is a summary of the estimates. (Details on next page.)

MANUFACTURING AND MINING	$34.3 Billion
PETROLEUM INDUSTRY	5.3
TRANSPORTATION AND COMMUNICATIONS	18.4
ELECTRIC AND GAS UTILITIES	12.0
FINANCE, TRADE AND SERVICES	25.0
TOTAL: ALL BUSINESS	$95.0 Billion

Decade of Expansion[1]

Since 1947, private business in the U.S.A. has invested $291 billion in new plant and equipment. Our manufacturing capacity has increased about 80%; electric power capacity, 145%; capacity for basic raw mate-

[1] Figures on "Decade of Expansion" are for the years 1947-1957 inclusive, except where specific reference is made to preliminary data for 1958.

THE McGRAW-HILL SURVEY OF MODERNIZATION NEEDS

Conducted by the McGraw-Hill Department of Economics in August, 1958

INDUSTRY:	AGE OF MANUFACTURING CAPACITY Percent Installed: Prior to Dec. 1945	Dec. 1945 to Dec. 1950	Dec. 1950 to Dec. 1957	COST TO REPLACE OBSOLETE FACILITIES: Millions of $
Iron and Steel	47%	16%	37%	2,855
Nonferrous Metals	47	13	40	1,022
Machinery	41	21	38	3,224
Electrical Machinery	34	18	48	1,917
Autos, Trucks and Parts	42	11	47	2,204
Transportation Equipment (aircraft, ships, railroad equipment)	59	9	32	854
Other Metalworking	54	17	29	2,351
Chemicals	30	23	47	3,070
Paper and Pulp	49	17	34	2,655
Rubber	46	9	45	600
Stone, Clay and Glass	46	20	34	1,840
Petroleum Refining	45	26	29	1,499
Food and Beverages	58	19	23	3,443
Textiles	59	18	23	1,001
Misc. Manufacturing	51	21	28	6,236
ALL MANUFACTURING[1]	48	19	33	34,771

[1] Includes petroleum refinery companies listed under "petroleum industry" in previous table.

rials, by 55%. The distribution and service industries have increased floor space by roughly 50% in the decade. In 1957 alone, business spent $37 billion on new plants and equipment – more than the combined expenditure in all of Western Europe plus Canada.

But all of this expenditure has not made our facilities as modern as supposed, or as modern as we need. Of the $291 billion invested by business since 1947, roughly $157 billion has been for expansion of capacity. Only $134 billion has been spent to replace old facilities with better, more modern equipment. And in recent years, this investment has not purchased as much new equipment as the dollar figures suggest, because prices of capital goods have climbed.

Our postwar capital investment has repaired the worst of the obsolescence accumulated during the depression and war years. But huge amounts of old equipment are still in use, as shown by the table above. This is based on a survey of the age of manufacturing capacity in several hundred companies, representing all of the major manufacturing industries. Almost 50% of our present capacity was installed before or during World War II. More than 65% was installed before Korea. Expert studies of the major non-manufacturing industries show that the age of equipment, in those industries, is even greater.

Thus, of all business plant and equipment, less than one-third is modern in the sense of "new" since 1950; two-thirds is pre-Korea.

This over-all figure is confirmed by a check on specific industries:

- Nearly two-thirds of our metalworking equipment was installed over 10 years ago, according to preliminary results of AMERICAN MACHINIST'S 1958 census.
- Over 65% of the freight cars on our railroads are more than 10 years old.
- Less than half the capacity to process chemicals, rubber or petroleum is new since 1950 – a period that has seen rapid development in such equipment as automatic controls for these process industries.

These examples take on a dollars-and-cents meaning when we recognize that the latest machine tools are about 40% more productive than 1948 models, and that a combination of new freight cars and modern freight yard equipment can reduce operating costs up to 50%. New instruments, that automatically direct the flow of a chemical (or other raw material) process, can often reduce processing costs enough to pay back the cost of the instruments in one year. These savings cannot be made in older plants. By using obsolete facilities, our industries accept a waste in labor and materials that totals many billions of dollars per year.

Why Productivity Must Rise

The U.S.A. can ill afford this waste. In the economic struggle between the free world and Communist world, our margin of superiority depends on the efficiency of our productive facilities.

For the growth of our own economy, we shall need a sharp rise in productive efficiency. During the next ten years, American business must provide the goods and services required for a population that will increase by 32 million. And the increased population will expect higher living standards. Furthermore, the population in ten years will include a higher proportion of dependent persons – children and retired people – and a smaller proportion of working age men. Thus, with a relatively smaller labor force, industry must provide more goods for more consumers.

At the same time, industry must strive to hold the line against rising costs. In an economy with a tight

labor supply, we cannot count on restraint in wage demands, however desirable such a development might be. In the past ten years, hourly wage rates have increased over 5% per year, nearly twice as fast as output per manhour. And this disparity may well continue – causing still more inflation—unless we make more rapid gains in productivity.

We can make these rapid gains – if industry goes all out to modernize its equipment. Output per manhour (in manufacturing) has increased only 2.5% per year since 1951. But this compares with gains of 4% a year in 1947-1950, and over 5% in the 1920s. Today the machines and techniques are available for us to equal, or exceed, these records – to raise output per manhour at least 5% per year. This is a job that can, and indeed must be done, to assure growth in the economy without inflation.

The Job Ahead

The dimensions of this opportunity are shown by the table on the previous page. In its survey on the need for modernization, the McGraw-Hill Department of Economics asked a wide sample of manufacturing companies how much it would cost to replace *all* their out-dated facilities with the best new equipment available. The Department also interviewed experts in each of the non-manufacturing industries, to find answers to this question. The answers add up to a staggering bill for new plant and equipment.

Modernization of over-age facilities – replacing only what is really obsolete, by today's production standards – would require a total capital investment of $93 billion, or nearly $20 billion per year for the next 5 years.

Furthermore, new production techniques will soon make *today's* plants obsolete, in many cases. Thus, to keep pace with technical advance *from 1958 on*, will require continuing expenditures of $8 to $10 billion per year for modernization.[1]

The total expenditure to wipe out the backlog of obsolete facilities, and keep up with continuing technical advance between now and 1963, would be at least $135 billion.

The U.S.A. has never spent such a sum on the modernization of industrial facilities. Capital expenditures of boom dimension have, in the past, been associated only with the urgent expansion of capacity. **Some forecasters are now saying that because industrial capacity is adequate, the next few years will be a period of low capital investment. The figures above make clear that this would be a national calamity.** The opportunity is there—and the challenge—to invest record amounts of capital in the modernization of plant and equipment.

A National Problem

This also is a challenge to the U.S.A. as a nation. For 100 years, this nation has been looked to as the model of economic development by the rest of the world. For the first time, we face a serious challenge by another nation and another economic system that claims to be better. In a carefully documented 111 page study released in May, the U.S. State Department declared that "the most serious threat" to the U.S.A. today is the drive for economic supremacy by the Soviet Union.[2] Although a much smaller nation industrially than the U.S.A., the U.S.S.R. is today increasing its national output at a rate of 7% per year and its output per manhour by 4% per year.

The U.S.A. does not have to match these specific figures, which represent the results of forced labor in a country just starting to develop industrially. In the contest to win uncommitted nations, the statistics are not likely to be quoted exactly, in any case. But our over-all growth in national output and living standards must be so impressive as to leave no question of superiority. Our factories must be showplaces of modernization to the foreign visitor that will leave him unable to say "I saw much better" in Britain, or West Germany, or Russia.

This is the challenge to the nation—a political challenge to be sure. But it coincides with the challenge to the business community and the individual firm. And the way to meet it is the same: by thorough and rapid modernization of our plant and equipment – not by the slow and steady pace of recent years, but at an accelerated rate that reflects the greater pressure for output at lower cost.

Obstacles To Be Overcome

We must face up to the fact that real obstacles – both technical and financial—stand in the way of faster modernization. Some companies do not have the technical "know-how" required for the latest production techniques. Many more lack the financial resources. How can we overcome such obstacles, and speed up the replacement of old facilities?

In the course of its study, the Department of Economics obtained comments on these questions from many executives. One of the problems, as we noted above, has been the urgent pressure to expand capacity during most of the postwar period. In giving their attention to this problem, companies have sometimes overlooked the chance to modernize older plants.

In some cases, equipment has been kept in place because it was satisfactory, and the users were not aware of still newer designs. Some equipment users believe that equipment makers are not sufficiently aggressive in designing and demonstrating new models.

The biggest obstacle – and one that presents a persistent problem – is the shortage of funds in many companies that need and want to modernize. For all corporations, the cash flow from retained earnings and depreciation has increased by more than $5 billion from 1953 to 1958. But a number of key indus-

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[1] This estimate is based on technical developments reported by McGraw-Hill editors and current price trends for capital goods. It is consistent with the plans for modernization expenditures in 1958-61 reported by companies in a McGraw-Hill survey conducted in April, 1958.

[2] "The Sino-Soviet Economic Offensive in the Less Developed Countries" – U.S. Department of State, May, 1958.

MODERNIZATION PAYS

Profits on modernization—like all business profits—have come down since 1955. However, modernization, in contrast to new capacity, still offers a relatively quick return on investment. Here are companies' answers to the question: "In cases where you are actually replacing old facilities with new plant and equipment in 1958—how soon do you expect these replacement expenditures to pay off?"

	PERCENT OF COMPANIES ANSWERING			
INDUSTRY:	1 to 2 yrs.	3 to 5 yrs.	6 to 8 yrs.	9 yrs. and over
Iron and Steel	11%	56%	11%	22%
Nonferrous Metals	29	71	0	0
Machinery	12	56	12	20
Electrical Machinery	29	57	7	7
Autos, Trucks and Parts	40	60	0	0
Transportation Equipment (aircraft, ships, railroad equipment)	7	53	20	20
Other Metalworking	38	33	10	19
Chemicals	10	53	21	16
Paper and Pulp	22	22	22	34
Rubber	33	33	34	0
Stone, Clay and Glass	0	57	36	7
Petroleum Refining	16	50	17	17
Food and Beverages	16	44	12	28
Textiles	37	47	5	11
Misc. Manufacturing	9	52	13	26
ALL MANUFACTURING*	18	50	14	18

*Note: Answers to a similar question, in a 1955 McGraw-Hill survey, were as follows: 1-2 years: 17%, 3-5 years: 64%, 6-8 years: 11%, 9 years or more: 8%.

tries have failed to keep pace with the general trend. **These include some of the areas where the need for modernization is most urgent: the railroads, large sections of the textile industry, some mining industries and many small to medium-size companies in manufacturing generally.** The problem of these industries and companies has grown more acute in 1958 – since their profits have declined much more than the average for all business.

Any plan to step up the pace of modernization generally must deal with the special situation in these problem areas. Depressed industries and companies need outside help, if they are to modernize. Such help would include a stronger flow of technical information and advice (and occasionally, venture capital) from the more prosperous, inventive industries – as well as advice from equipment suppliers and distributors, industrial publishers and consultants. There is also a public responsibility to help in the problem areas—not with handouts of government money, but with technical assistance and help in finding private capital (like the efforts now being pursued by the Small Business Administration).

Certainly we should lose no time in reforming those provisions of the federal tax laws that now impede investment in modern equipment by hard-pressed firms – especially the outmoded and unfair restrictions on rates of depreciation for tax purposes. At present, the tax regulations require that depreciation be computed over relatively long periods of "useful life" for most types of equipment. And this is a primary reason for the lag in modernization. Machinery generally becomes obsolete long before the expiration of its "useful life" as specified in tax regulations. But it is difficult for companies – especially small companies – to set aside cash for rapid replacement, unless the full amount to be set aside is exempt from income tax. Canada and most European nations allow more rapid depreciation for tax purposes than does the United States.

A combination of self-help with technical help, and a fair break from the tax laws, would do much to reverse the spreading tide of obsolescence in depressed industries, and in many small companies.

PLAN '59

It is this combination that McGraw-Hill advocates as "PLAN '59", to help business modernize *now* for growth and profits. This is what it will take to make a start in 1959 on the $95 billion job of modernization, disclosed by the study we have just completed:

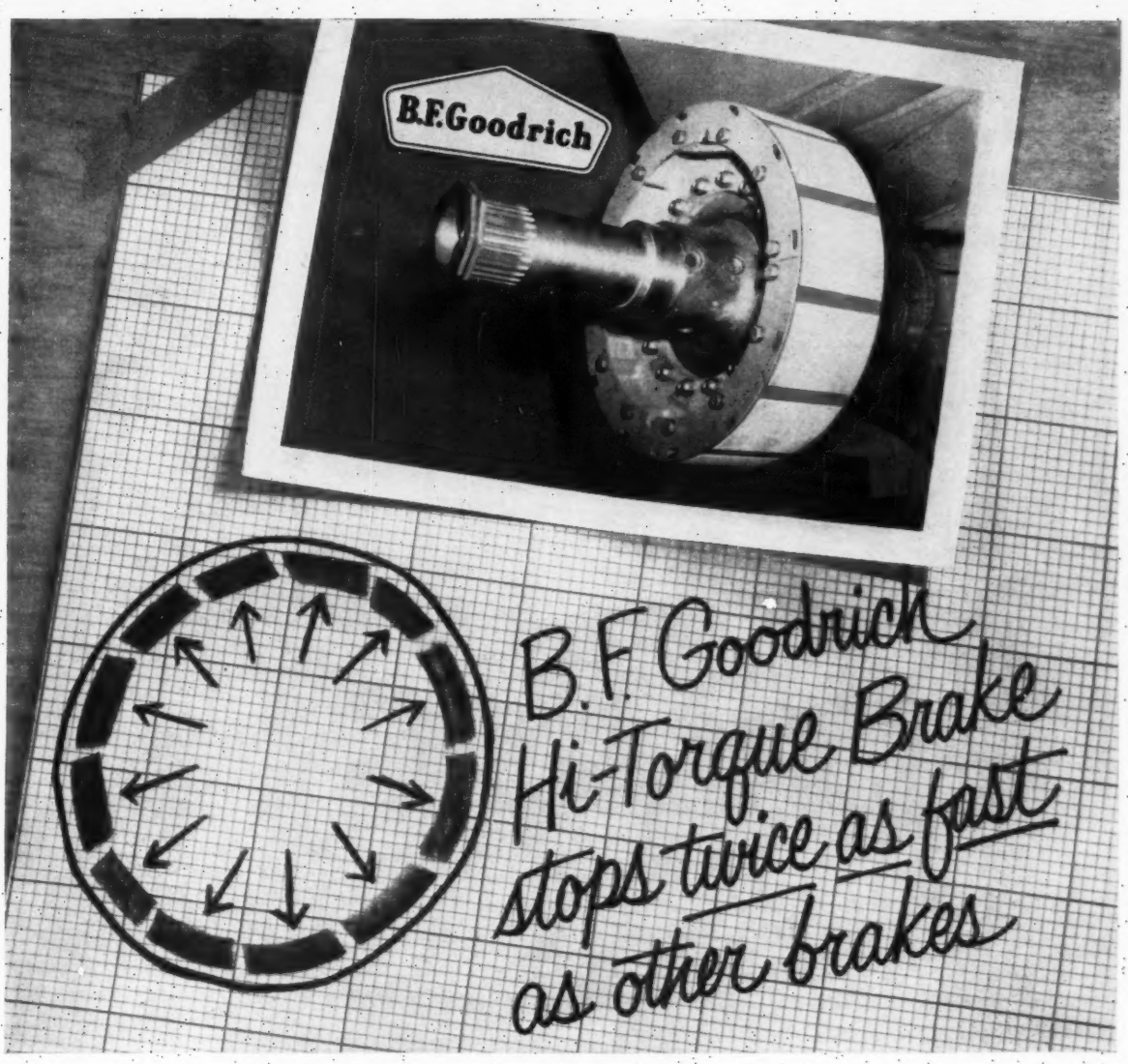
1. A better flow of technical information on where and how to modernize business plants and equipment.

2. Careful review by the individual company of its own opportunities to modernize at a profit – then action to replace obsolete facilities.

3. Reform of the tax laws, to allow more realistic deductions for depreciation, and permit more companies to finance adequate modernization programs from this source of funds.

Much of this program is already underway. The 34 McGraw-Hill Publications, and many suppliers and distributors of industrial equipment, have stepped up their information programs to start the modernization drive. Preliminary plans of manufacturing companies show a strong emphasis on capital spending for this purpose. In August, Congress passed a bill providing limited tax relief for small business.

But the real task of modernization still lies ahead. It is the greatest challenge, and the greatest opportunity, confronting American business as we move forward into 1959.



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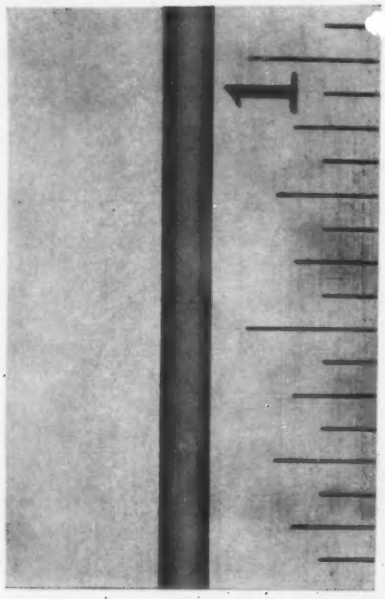
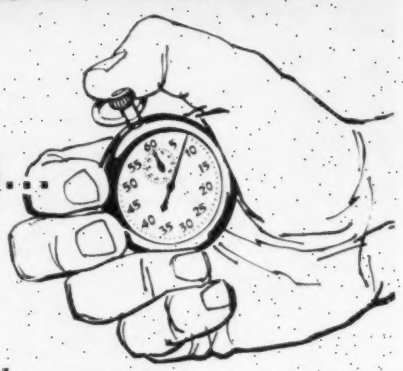


Measure the build-up height...

Clock the deposition rate...



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Literature available

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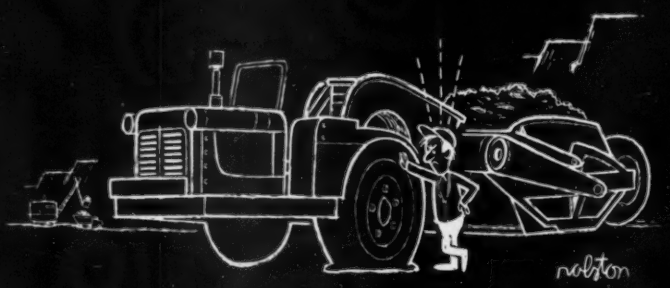

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PLAN '59 FOR WHAT'S AHEAD

The Challenge

The report detailing the up-to-dateness—or lack of it—of American industry beginning on page 79 is of special significance to the construction contractor.

In it, the McGraw-Hill Department of Economics points out that "modernization of over-age facilities—replacing only what is really obsolete by today's production standards—would require a total capital investment of $95 billion, or nearly $20 billion per year for the next five years. Furthermore, new production techniques will soon make today's plants obsolete in many cases. Thus, to keep pace with technical advances from 1958 on will require continuing expenditures of $8 to $10 billion per year for modernization."

Those are staggering figures. Admittedly a lot of the $95 billion obsolescence is in production tools such as lathes and looms. But a lot of it, too, is in obsolete factory buildings and other structures.

Thus the report has a double meaning for contractors. Much of the needed modernization will require the contractor's services. Yet he also must modernize his own equipment fleet, his own office and shops, his own construction plant to keep abreast of competition.

On the following pages *Construction Methods* outlines the problems and opportunities the contractor will find in 1960 and beyond—to help you plan for what's ahead. The prospects are exciting, but not without problems.

In 1960 the volume of contract awards should be close to 1956's record, and the trend will continue upward. Paralleling the needs of American industry to modernize are the needs for expansion of public facilities such as schools and hospitals and sanitary facilities under pressure of continued population growth.

The increased market for construction, of course, does not necessarily mean an automatically increased prosperity for the contractor. He has been operating in an expanding economy for years, yet failures continue to run high. Competition will be still rougher in the years ahead as more people get into the business and as smaller firms become larger.

The contractor will have to contend with shortages of skilled labor. Carpenters, plasterers, and ironworkers, for example, are retiring or quitting faster than they are being replaced from apprentice ranks. And wages and fringe benefits are sure to keep going up.

While there will be no shortages of steel or cement, the contractor will have to learn to work with increasing quantities of newer construction materials such as aluminum and reinforced plastics.

As for construction techniques, chances are that controlled atomic blasts will be adapted to specialized earthmoving operations. And there will be more jobs with lift slabs, tilt-up walls, thin-shell roofs, and prestressed members.

Equipment prices will go up. New machines will be introduced and existing models improved. But don't look for any radical changes. Manufacturers will concentrate on reducing a machine's cycle time, thereby boosting its productive output.

Will you be ready for this coming decade of change and growth? Will you get your share of the business—and do the work profitably? You won't unless you, too, continue to modernize.

One area for concentration is on office procedures and record keeping. For without accurate and complete records, bidding becomes chaotic. There already are enough variables in contracting to give it a semblance of gambling. You add more at your peril.

As for construction plant, it goes without saying that it must be as modern and as well maintained as possible. Admittedly today's machine is better than yesterday's. It costs more, too. But productivity has more than kept pace with price increase, resulting in lower unit output cost.

Nevertheless, contractors are still operating equipment beyond what they themselves consider its useful life (page 134). In large measure this is due to the machinery depreciation policies of the Internal Revenue Service. So pressure must be brought to bear on Congress and the Treasury Department for better and more realistic treatment of the contractor in this vital area.

However, despite some of the seeming roadblocks, there's an exciting future for the construction industry in the coming decade of growth. But the profits and success will go only to those contractors who, while helping American industry modernize, can modernize themselves. For, as an American Management Association publication says, "Remember that no war, no strike, no depression can so completely and irrevocably destroy an established business as new and better methods in the hands of an enlightened competitor."

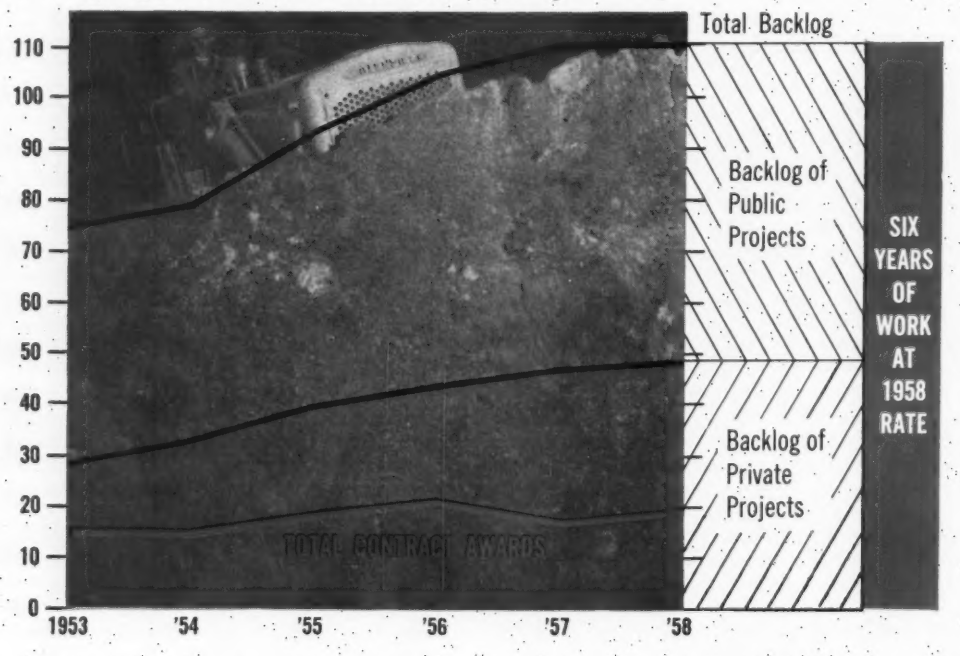
The market for construction is expanding . . . on the next page

PLAN '59 FOR WHAT'S AHEAD

U. S. Construction Needs Mount

The construction industry will be called on to build public and private facilities of all types at a steadily increasing rate during the decade of the 1960's to meet the needs of a fast-growing population and an expanding industrial economy.

The Backlog of Planned Construction Builds Up



The U.S. is heading into the greatest heavy construction boom in history.

It's not a matter of pork barrel politics or anti-recession spending. The big construction boom of the 1960's will be based solidly on the essential requirements of a fast growing population and an expanding industrial economy.

Right now there is a mountain of projects in the planning stage. The Backlog of Heavy Construction, compiled by *Construction Methods*, adds up to a husky $111 billion. That's more than five times the total value of contracts let in 1956, the peak year so far; it's almost six years' work at the 1958 annual rate of awards.

This is essential work, designed to meet pressing needs. Unless these projects move from drafting boards out to contract in a steady flow over the next six or seven years, the crush on existing facilities by the late 1960's will reach staggering proportions.

In 1960, the boom will be just getting started. Many projects now in the planning stage won't go out to contract until later. But total heavy construction business in 1960 will be at least 10% better than this year.

Construction Methods forecasts a 1960 contract awards volume of $21,500 million, just a shade under the 1956 record of $21,700 million. The 1960 total compares with a forecast for this year (based on actual awards for the first seven months) of $19,480 million and a 1957 total of $17,986 million.

Two major influences will shape the construction boom of the 1960's. One is the fiscal and monetary policy of the federal government. The second is a foreseeable population trend.

Washington's efforts to "stabilize" the nation's economy by manipulating interest rates to curb inflation in times of general prosperity and encourage investment during recessions hits construction harder than most industries. When the cost of borrowing money is high, many state, municipal, and private projects are postponed, sometimes even though they are badly needed.

In addition, the federal government can release or hold back federal projects planned and approved for construction. Early this year the federal government opened the floodgates, sending out to contract many of its projects that had been dammed up since late 1957. This spurred a very rapid increase in heavy construction contract awards. Then Washington reversed this policy. Now federal awards are only a shadow of the April-July volume.

Changes in the age structure of the nation's population will influence the type of public facilities most needed. During the past five years there has been a great increase in the number of persons between the ages of 25 and 34. But by 1965 this group will shrink from the 1955 count of 24,100,000 to about 21,500,000. Reason is the low birth rate of the depressed 1930's.

This means that the demand for additional housing and such municipal facilities as schools and water and sewerage facilities will rise at a slower rate between now and 1965 than in the 1950's.

This decline in the 25-34 age group will be only temporary. Between 1965 and 1975 their number will literally explode—and so will their needs for new construction. By 1975 there will be 34% more people in this age group than there are today.

That's a major reason why government and industry must replace worn out facilities and add new facilities at a steadily increasing rate throughout the decade of the 1960's.

Public

Contract awards for dams, highways, bridges and all types of non-building public construction will hit a record high this year. In 1960, awards for this broad area of construction will top the 1958 record by 16%.

Construction Methods predicts heavy non-building contracts in 1960 will amount to $9,450 million compared with $8,175 million this year.

Highway work will lead the field with a gain of 23% over this year's very substantial rate of awards. And construction of bridges, waterworks, and sewerage facilities also will reach record highs.

Public building contracts, on the other hand, will begin to taper off next year. That's because the huge "Capehart" military housing program will reach its peak this year and then drop off sharply.

Public housing contracts amounted to $642 million last year. This year's total will reach $1,250 million. But the 1960 total will be only about $900 million, a drop of 28% from the 1958 peak.

Despite this steep drop in public housing construction, contract awards for all types of public works in 1960 will stand at least 6% above the 1958 level. Total volume in 1960 will amount to $12,150 million compared with $11,450 million this year and $9,600 million in 1957.

Private

Contract awards for private heavy construction in 1960 will be 16% greater than this year's relatively low volume.

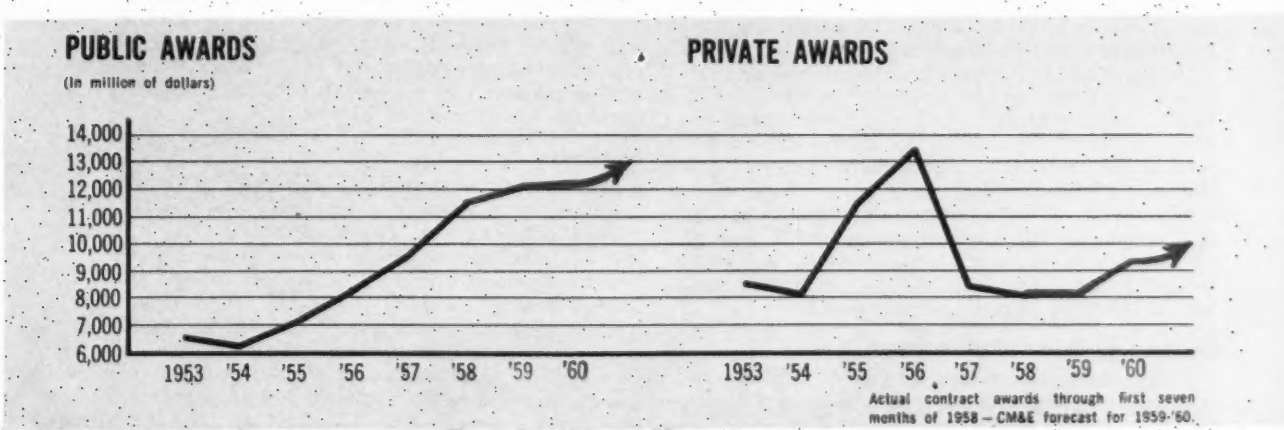
All four categories of private construction will show substantial gains. Commercial building will rise 24% to an all-time record of $2,200 million. That compares with $1,780 million this year.

Industrial building will begin to recover from its current depressed level, and this may be the most significant trend in the field of private construction. Industrial building contracts hit a record high of $5,335 million in 1956, then dropped off sharply. In 1957 they amounted to $3,081 million; this year they will total $1,900 million; and in 1959 they are estimated at only $1,500 million. But the 1960 awards will bounce up to $2,100 million with every prospect of moving substantially higher in succeeding years.

Private mass housing will move up 13% above the 1958 level; 1960 awards will total $4,300 million compared with $3,800 million this year and $3,041 million in 1957.

Unclassified private work, mostly pipelines and private hydroelectric projects in the Northwest, will score the biggest percentage gain over this year—a rise of 39%. Awards in this category will reach $750 million in 1960 compared with $540 million this year and $500 million in 1957.

Turn to the next page for a survey of trends during the 1960's



PLAN '59 FOR WHAT'S AHEAD

TRENDS IN THE 1960'S

Highways and Bridges

By 1960, construction contractors will be taking on $5,200 million a year in new highway and bridge contracts. This represents a 22% jump over the 1958 rate of awards—a 23% climb for highways and an 18% rise in bridge awards.

There is one hitch to this forecast. Congress must appropriate—or in some other way provide—enough funds to pay the federal share of authorized interstate highway obligations for the fiscal year 1961. This is necessary to avoid a debacle such as occurred late in 1957 and early in 1958. Then, pay-as-you-go provision of the 1956 Highway Act restricted the payout rate to much less than the total authorized by the same law and forced a cutback in contracting schedules.

By 1960, the impact of the interstate and expanded ABC highway construction programs will be felt in every state. Each should have most of its engineering and right-of-way problems cleared up so contracting schedules can hit full stride.

The impact of interstate highway construction on other types of building will begin to make itself felt by 1960. Industry will locate new plants and other facilities along the new interstate routes, and new suburbs will spring up. Some industrial parks will spark residential developments.

As the interstate system moves from the drawing boards to highways and bridges put in place, heavier and faster traffic streams moving to marketing centers will accentuate the need for urban highways and for better rapid transit facilities.

Airports

Airport construction contracts let by city and county agencies will climb from the current rate of $100 million per year to $150 million or more by 1960. The jet age for commercial air traffic is here, but the U.S. still has a backlog of well over $1 billion in needed improvements to existing airports.

Prospects for an early start in correcting this major deficiency in airports dimmed a bit with the President's veto two months ago of legislation to expand the federal aid program for airports. The current program expires next June.

Unless there is a reversal in the Administration policy, the whole load of airport improvement will be on local governments and the carriers themselves. This may slow progress to less than would be accomplished by federal contributions, but it won't stall airport construction.

The coming of the jet plant onto commercial airline schedules will spur helicopter feeder service, already instituted in some major cities. By 1960, heliport construction could become common in cities within 100 miles of metropolitan centers.

Earthwork, Dams, Waterways

Corps of Engineers and Bureau of Reclamation construction plans promise a high volume of future awards for river and harbor development, hydro power, flood control, and irrigation.

At this time, the estimated cost of such projects, plus similar construction being planned by state and local agencies, amounts to more than $11.6 billion.

This is nearly $1 billion less than the recent record high reached by this category in the *Construction Methods* backlog because the sharp upsurge in 1957 and 1958 contract lettings cleared many jobs out to contract. Though this work is no longer piling up on the drawing boards, the existing backlog amounts to 12 years' contracts at the 1958 annual rate.

The forecast of $750 million for this type of work in 1960 should be considered a floor above which the actual awards may rise. The declines in 1959 and 1960 from the booming pace of 1957 and 1958 reflect an expected drop in state and local projects. A speedup of federal contracting schedules could offset these declines because so much work now in planning will be ready to go under construction as soon as the money is appropriated.

Right now there is no sign that the Eisenhower Administration is of a mind to speed things up. Several large dams let in 1956 and 1957 will eat up the sums already appropriated.

But it's only a question of time before the large backlog of these projects must be faced up to. The early 1960's will have to bring a sharp rise in this type of construction—to over $1 billion per year.

Water Resources and Sewage Treatment

Rising population (both individuals and businesses) and increasing per capita consumption push water to the top of the list of prerequisites to future growth of the country.

Construction of water gathering, transmission, purification and distribution facilities will continue to rise. By 1960 contract awards will be 20% greater than in 1958. *Construction Methods* figures on waterworks projects now in planning show we must spend a record $2.7 billion just to catch up with demonstrated needs. This is six times the 1958 annual rate of awards.

To protect water resources, sewage treatment plant construction will forge ahead. Suburbs created by the housing booms of 1950 and 1954-1956 find that population density now requires sewerage lines and waste disposal plants. Overloaded existing plants and the development of new residential areas will compound the sewage and water protection problems which confront us now.

Pipelines

Construction of natural gas pipelines is on the threshold of a vigorous upturn. And while awards will not climb back to the record rate in 1950, both 1959 and 1960 should see a sharp increase in pipeline construction over the low volume of the last three years.

Large pipeline projects were stymied during the last year or so by the so-called "Memphis decision" of a Federal Court which in effect ruled that the gas carriers had to get approval of their customers

before changing prices. However, the large volume of financing which pipeline firms have arranged in the past two months indicates they have decided they can live with this ruling. They are now going ahead with projects which have been languishing in the planning stage.

Industrial Building

No upturn in industrial building contracts is in sight for the next 12 months. Two booms in industrial plant expansion during the past seven years have lifted the nation's productive capacity to a point well in excess of the current rate of sales. Over-all manufacturing capacity is now about 55% greater than in December, 1950, according to the McGraw-Hill Department of Economics.

However, as of last spring manufacturers planned to add 15% more capacity by 1961. This will feed enough work to contractors to keep their new industrial business in 1959 from falling under the low rate of this year's second half.

When the turnaround comes, contracts will rise swiftly as in the early stages of past expansions of capital spending. By 1960, demand for goods will have risen to the point where industry will need more capacity to handle orders. In addition, research and development will have created many additional products and new processes to improve existing products. This will boost the need for new manufacturing plant construction.

The rapid growth of spending on research and development means a much greater impact on construction with each passing year. Though the growth of this type of spending has been particularly great in the 1950's, further big increases are planned. By 1961, industry plans to jack its annual budget up by 35% over 1957 to $9.9 billion.

Half of this spending goes for developing new products and 10% goes for new processes, a total of 60% for developing new reasons for buying construction. According to manufacturers, most of this investment (about 90%) pays off within five years. And about 40% pays off in three years or less. Obviously, this short time lag means that industrial construction soon will turn upwards.

Commercial Building

The strongest part of the private construction market during the next two years will be commercial building—office buildings, stores, college building, and other private institutional structures. Several store chains are going ahead now with their expansion programs, most of which are long-range and call for 100 or more new stores to be built each year.

Office building has not kept up with demand for additional space and for modern facilities to replace outdated buildings. It will have to increase rapidly to catch up.

A sharp rise in enrollments, plus federal aid for improving science education facilities, will spur construction at colleges and universities.

Urban redevelopment programs, long bogged down by problems such as relocating tenants living or carrying on business in the rotting cores of cities, show signs of progress now. By 1960, urban renewal will be going ahead much faster, and contractors will feel the effects through increasing contracts for apartment houses, stores, and other commercial, recreational, and cultural buildings.

Competition for jobs will become more intense . . . on the next page

Contract Awards Will Move Steadily Higher

As reported by CM&E
(In millions of dollars)

	1957 Actual	1958 Forecast*	1959 Forecast	Change '58-'59 %	1960 Forecast	Change '59-'60 %	Change '58-'60 %
By Type of Work							
Other Than Building	$7,114	$8,175	$9,025	+10	$9,450	+ 5	+16
Waterworks	369	400	450	+13	500	+11	+20
Sewerage	556	600	650	+ 8	650	0	+ 8
Bridges	781	760	885	+16	900	+ 2	+18
Highways	2,964	3,500	4,000	+14	4,300	+ 8	+23
Earthwork, waterways	969	975	800	−18	750	− 6	−23
Unclassified, public	975	1,400	1,600	+14	1,600	0	+14
Unclassified, private	500	540	640	+19	750	+17	+39
Buildings	$10,871	$11,305	$11,125	− 2	$12,050	+ 8	+ 7
Private Mass Housing	3,041	3,800	4,000	+ 5	4,300	+ 8	+13
Commercial	1,754	1,780	1,925	+ 8	2,200	+14	+24
Industrial	3,081	1,900	1,500	−21	2,100	+40	+11
Public Buildings (excl. hsg.)	2,353	2,575	2,600	+ 1	2,550	− 1	− 1
Housing	642	1,250	1,100	−12	900	−18	−28
Total heavy construction	**$17,986**	**$19,480**	**$20,150**	**+ 3**	**$21,500**	**+ 7**	**+10**

*Based on actual 7 months total

PLAN '59 FOR WHAT'S AHEAD

Competition for Jobs Will Be Stiff

The number of contracting firms in the heavy construction field is increasing steadily, and individual contractors also are expanding. It adds up to an extremely competitive situation, even with a near-record volume of work going to contract.

Look for still keener competition for jobs in 1960. The years ahead are really going to test the ability of contractors to run efficient business organizations, work out improved construction methods, and figure costs with a sharp pencil.

One reason to expect tougher competition is the steadily increasing number of firms in the heavy construction field. In 1950, there were 6,886 contractors who signed up at least $100,000 of new business; by 1957 the number had grown to 9,234. By 1960, *Construction Methods* estimates the number will jump another 20% to a total of 11,100.

In addition, individual contractors will continue to grow. And as they increase their capacities, they will compete for larger volumes of new business to keep their crews together, equipment fleets working, and profits rising.

This adds up to an extremely difficult competitive situation. While total contract awards increase about 18% between 1957 and 1960, the number of contractors will jump 20% and their capacity to handle work will grow 30%.

In 1956, when total heavy construction contract awards hit a record $21.7 billion, contractors had to strain to handle all the available work in some categories, particularly industrial building. The capacity of contractors has increased substantially in the last two years; by 1960, when total contract awards are expected to be $21.5 billion, contractors will be able to handle at least $30 billion of new work without spreading themselves too thin.

The trend toward smaller construction contracts may take some of the sting out of the rugged competitive battle ahead. The number of contracts awarded will increase faster than the total dollar volume of heavy construction contracts.

Industry, for example, will be contracting for construction of more small plants and fewer of the huge "from the ground up" additions to capacity over the next few years. There should be more office building contracts awarded. And government contracting agencies can be expected to take advantage of the competitive situation, with its resultant savings in construction costs, by breaking up construction projects—particularly highway jobs—into smaller sections to attract more bidders.

Between now and 1960 the number of contractors handling non-building projects will increase faster than the number of building contractors. *Construction Methods* estimates that non-building contractors with $100,000 or more of new 1960 business will number 7,300. That's nearly 1,800 contractors—or 30%—more than the count in 1957.

Highway contractors will lead the list. In 1957 there were a few more than 2,700 highway contractors, each with a total of at least $100,000 or more of highway and other construction work. In 1960 there will be 1,000 more firms in this group.

The number of contractors competing for other types of non-building heavy construction—bridges, waterworks, sewerage, airports, dams, tunnels, and pipelines—also will be well above the current level.

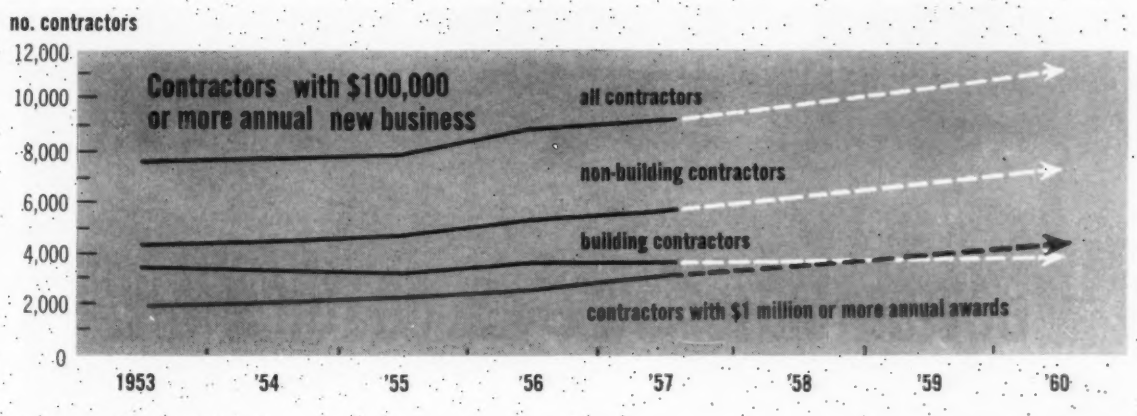
Building contractors will increase more gradually. By 1960 there will be 5% more of them. This figure includes firms that handle industrial buildings costing at or above a minimum of $100,000 and other public or private buildings, including mass housing developments, costing $350,000 and up. These contractors are expected to number a record 3,800 firms in 1960, compared to 1956's previous high of 3,662.

The sharpest rise in building contractors included in this group will be those building commercial, office structures, stores, and industrial plants. However, there will be fewer firms in the industrial field in 1960 than in the record year 1956 when there were 1,409 firms with industrial building contracts aggregating $100,000 or more.

While the total number of heavy construction contractors continues to increase between now and 1960, many firms also will move up the size ladder.

In 1957, there were 3,178 contractors who signed up $1 million or more in contracts during the year. Of these, 1,716 handled heavy construction other than buildings. The other 1,462 firms were essentially building contractors.

The growth in these large firms has been rapid and will continue from now to 1960, especially in the group doing non-building heavy construction. If they represent the same proportion of all 1960 contractors doing $100,000 or more annually as in 1958, the "million dollar and up" contractors will number over 3,800 in 1960. This would mean an increase of roughly 650 firms over the 1957 count.



But these bigger firms have been growing more rapidly than heavy construction contractors as a whole. In 1950, they made up 26% of the total number of contractors with at least $100,000 of new business. In 1957 they represented 34% of the total. This trend will continue. By 1960, "million dollar and up" contractors will number about 4,150 firms, an increase of 1,000 over the 1957 count.

During 1958, construction contractors are buying a near record amount of machinery, equipment, and parts. Total spending is expected to top $1.7 billion, second only to 1956's record of $1.8 billion.

Next year and 1960 will see contractors investing even more in new equipment and parts. By 1960, their purchases will rise to a new record high of about $1.9 billion.

More machinery and equipment mean greater contractor capacity. And by increasing their capacity to handle a larger volume of new contracts, contractors also will put added pressure on themselves to obtain additional jobs. For only by keeping their equipment moving can contractors recover their outlays for these machines.

This will contribute to the stiffer competition in 1960. But just as machines help intensify competition, they also help contractors compete more successfully. That's because the contractor's best way to meet the prices of competitors is by lowering unit costs. Here, the edge goes to the contractor with the more modern, productive equipment.

Stiff competition is trying, but it's also stimulating. The more competition, the harder contractors will fight to hold costs down. And the more successfull they are in devising cost-saving methods, the faster the heavy construction market will grow.

This is no easy battle, but contractors have a fine record of success in holding down their selling prices in the face of the steady uptrend in the cost of materials, labor, and machinery. The cost-price squeeze has "separated the men from the boys" the record of business failures shows. But contractor profit margins have been dangerously low during the periods of hottest competition.

A new cost push is now under way as materials prices firm up. Between now and 1960, the basic construction materials—steel, lumber, and cement—are expected to move up by at least 3%. And after 1960, the uptrend in materials prices will become steeper. This new spiral in materials prices will add to the problems of the contractor. Earlier this year, wage increases were his only major concern when estimating likely cost advances over the life span of new 1958 contracts.

Signs point to still other upward pressures on costs. Equipment prices may start to creep up during the next few months. Another 5% added to current prices seems likely by 1960.

Secondly, the cost of working capital is edging up. Though borrowing costs—and the availability of working capital and equipment loans—will probably not be major factors in the 1958-60 cost push, wary contractors will watch them closely and allow for them in estimating future costs.

As cost increases push up contractor selling prices, the value of the construction dollar shrinks. This means a cut in the purchasing power of the construction industry's customers. Some of these customers will realize that the future trend in construction prices is up and they can save money by going to contract now rather than later, but others will be priced out of the market. Among the latter are buyers of schools, waterworks, sewerage, roads, bridges, airports, and facilities to provide other community services. When they find a project will cost more than the bond issue provides, it often means the whole process of finding debt service funds in their budget, holding a bond election, and selling the bonds must be repeated before bids can be called again and the job awarded. And long-range development projects can be held up if rising construction costs outrun the revenues available to pay construction bills.

Rising costs likewise affect the decisions of industrial and commercial firms to start new construction or carry out planned construction programs. The rapid rise in costs during 1955-57, for example, forced some manufacturers to slow their plant spending, particularly in view of slumping sales and a squeeze on their working capital and profits.

Rising costs also are the target of federal government policies. Washington cuts back on federal contracts and tightens credit when prices are on the rise. Both of these moves hurt contractors.

So it's to the benefit of the industry that contractors operate in a competitive market, under compulsion to devise new ways to beat the curse of rising costs. How well they do this job will help determine how fast their market grows. If the 13 years since World War II are any guide, contractors will continue to enjoy a substantial growth in new business partly because of their proven ability to invent cost-saving construction methods.

New, improved materials soon will be available . . . on the next page

PLAN 59 FOR WHAT'S AHEAD

Better Materials Are on the Way

There'll be substantial progress right across the board in developing improved construction materials. New plastics, much stronger but lighter steels, prefabricated structural aluminum, and more versatile concretes all will be available before long.

Plastic materials will serve the construction industry in a fantastic variety of ways in the 1960's.

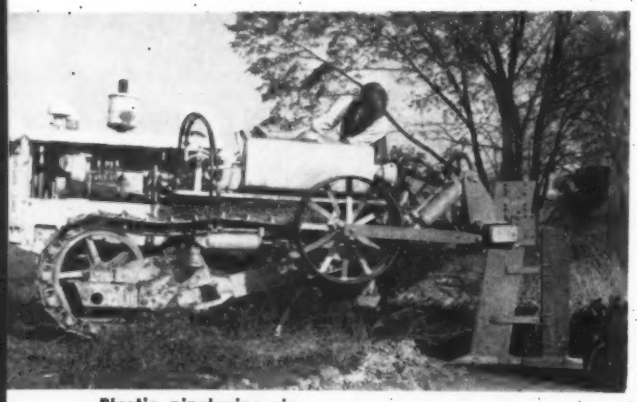
After years of research, the plastics industry now is developing at a fast pace. It is turning out a steady stream of new plastics capable of competing with standard building materials in a multitude of applications.

Some recent developments illustrate the versatility of plastic materials. For example, Caterpillar Tractor Co. has designed an experimental machine that digs a trench for a sub-surface drainage system, forms pipe from a plastic sheet, lays the pipe, then backfills the trench.

Operated off a Caterpillar D4 tractor, the rig can place drain pipe at a rate of 1.5 mph and at a cost of only 7¢ per lineal foot. That's about 25% of the cost of laying drain pipe by current methods.

Carlon Products Corp. of Cleveland is marketing a plastic conduit pipe with a rubber and styrene base that can be cut with a handsaw and joined simply by brushing solvent cement on the ends and pushing lengths together. Carlon says one man can install 100 ft of pipe in 40 minutes.

The drop pipe in wells to relieve hydrostatic pressure behind Long Sault and Barnhart Island Dams on the St. Lawrence are B. F. Goodrich's Koroseal polyvinyl chloride. And a polyethylene film waterproofs a sludge lagoon at Edmonton, Alberta, Can.



Plastic pipelaying rig

Within a few years contractors will make wide use of plastic concrete forms capable of more than 100 reuses, rustproof plastic hand tools, prefabricated plastic field offices, foamed-in-place plastic insulation, and a variety of plastic structural elements. Plastic strands may even replace steel in some types of prestressed concrete.

Plastics reinforced with glass fibers, asbestos, sisal, and all sorts of metal alloys now are finding their way onto construction jobs in substantial volume. Construction took about 15% of the total volume of the reinforced plastics industry in 1957. That's about 25,000,000 lb. Most of it went into flat and corrugated paneling.

This year the reinforced plastic industry expects construction to use 10% to 15% more of its products. And it sees substantial future volume in sandwich-type curtain walls and structural members.

A Connecticut manufacturer already is setting up to manufacture reinforced plastic roof beams, slabs, and panels. Transwater Corp. of Newington, Conn., will produce structural units of plastic cast around a truss of hollow steel tube reinforcing. After the units are erected, the tubing will be filled with grout. Transwater will market these units to industrial, commercial, and home builders.

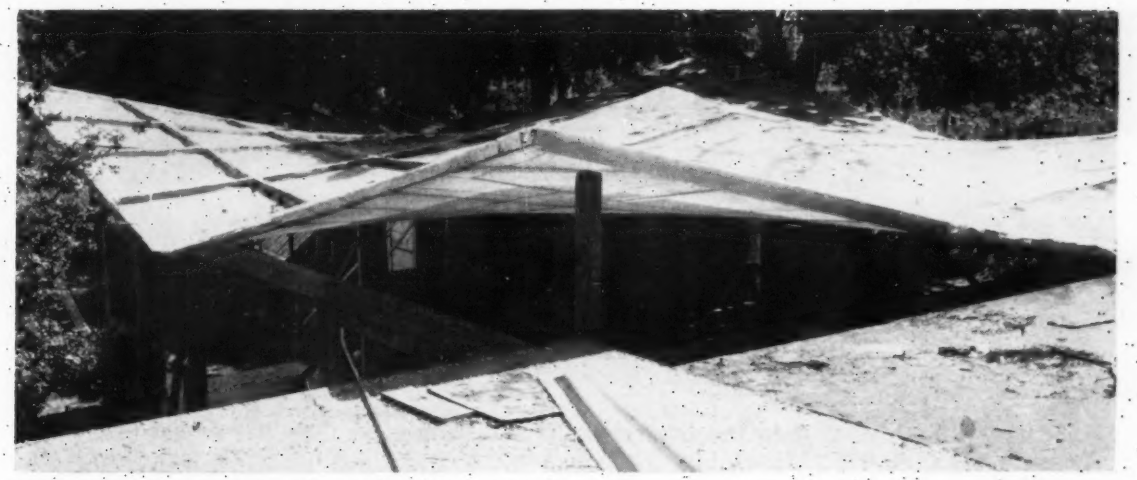
Steel

The steel industry stands on the threshold of a major scientific breakthrough. Within a few years steelmakers will be able to produce bridge strands as thin as piano wire and girders 60 ft long that two men can lift without mechanical help.

The breakthrough will be the result of research into the atomic structure of steel. With exact knowledge of what makes a crystal of steel strong, it will be possible to produce steels of fantastic strength with far less weight and bulk.

How soon will these revolutionary steels be available? The American Iron and Steel Institute says researchers at industry and university laboratories believe they are almost ready for the breakthrough now.

Until these new steels arrive, all major producers will continue to improve the quality of the high-strength, lightweight steels now in production. These specialized steels would have seemed revolutionary a decade ago.



Plastic hyperbolic paraboloid

Some of them combine high yield strength and high tensile strength with improved corrosion resistance and weldability. They are excellent for structural purposes. Others, with high impact strength and wear resistance, make relatively lightweight but rugged components for many types of construction equipment.

Aluminum

Aluminum products, too, are making a concentrated effort to turn out structural materials for the construction industry.

In 1957, the construction market consumed 793,000,000 lb of aluminum. Most of it went into architectural items and hardware. Aluminum producers expect construction will take nearly twice this much —or 1,425,000,000 lb—in 1960. And a major portion of it is slated for structural purposes.

Bridge builders probably will make the most extensive use of structural aluminum. The first aluminum girder highway bridge in the world has just been completed near Des Moines, Ia. It is a 222-ft-long, welded structure. Aluminum members were shop fabricated and shipped by rail to the site in four subassemblies, each 12 ft wide and from 95 to 126 ft long.

Its construction was sponsored jointly by the Iowa State Highway Commission and three of the major producers of aluminum—Alcoa, Kaiser, and Reynolds. Sponsors hope it will demonstrate the structural and fabrication advantages of aluminum and stimulate a broader use of aluminum in the highway construction program.

Another aluminum bridge, fabricated on proven aircraft design principles, is going through a series of tests at Lehigh University in Bethlehem, Pa. It was designed and built by Fairchild Engine and Airplane Corp. Co-sponsors are the Bureau of Public Roads and four of the major aluminum producers.

This test bridge is a series of box-type triangula girders fabricated from thin-gaged stressed sheet aluminum. It is designed for prefabrication in sections that can be trucked to site and mounted on piers.

Concrete

Concrete will remain "old reliable" as a construction material but will add new dimensions to its versatility.

Prestressing yards will appear in almost every major city in the country enabling contractors to buy standard sizes of beams, purlins, curtain walls, and slabs by number from catalogues just like structural steel members. And many contractors will go into the business of manufacturing prestressed components.

The trend towards odd-shaped structures will create a new, important demand for concrete admixtures. Shapes of the new structures like concrete hyperbolic paraboloids, thin-shell roofs, and odd-shaped cast-in-place structural units will require special concretes that only admixtures will be able to meet.

They will control slump, improve workability, accelerate or retard hardening, aid curing, waterproof, improve wear resistance, reduce shrinkage, prevent "bleeding," and impart integral color—all with pinpoint control.

Pozzalanas will be most important. Acting as pore fillers, they will provide increased workability to concrete while cutting down on shrinkage. These will figure strongly in the odd-shaped structures such as the hyperbolic paraboloids.

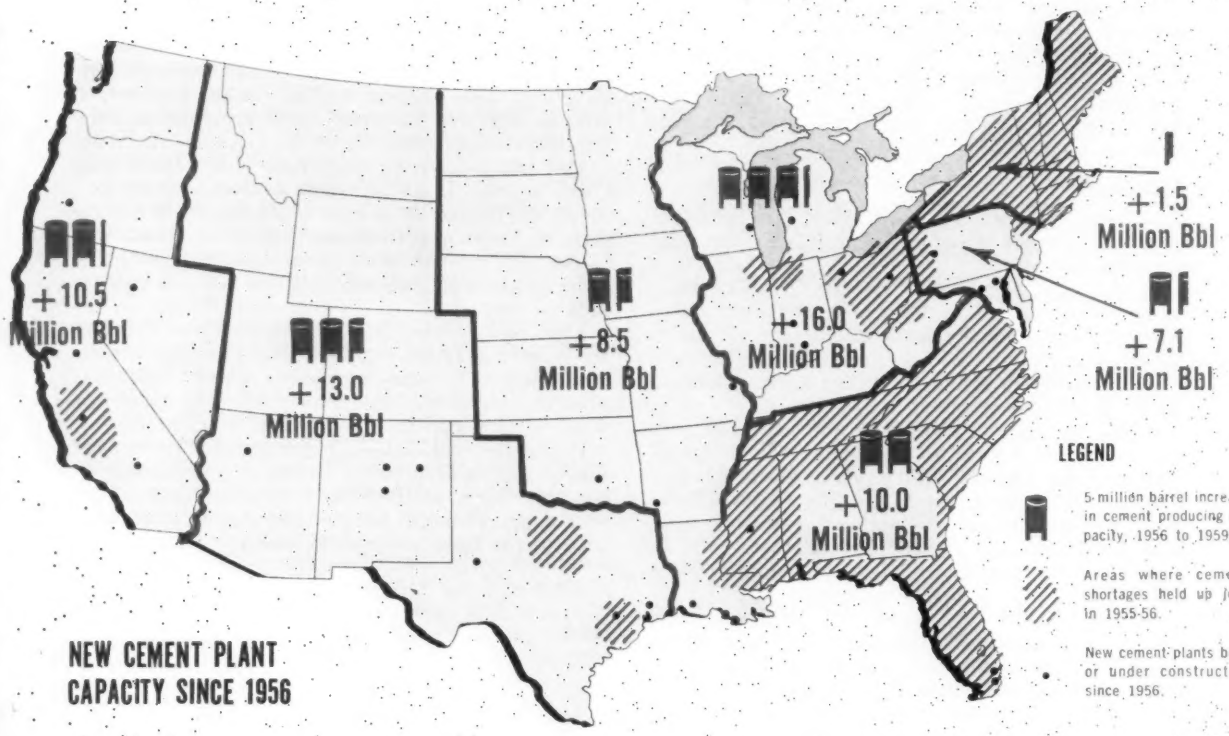
No shortages of steel or cement are likely . . . on the next page

Aluminum bridge section

PLAN '59 FOR **WHAT'S AHEAD**

Supplies of Steel and Cement

Shortages of these two basic construction materials, like those that plagued contractors in 1956, are not in the picture for 1960. Producers of both cement and steel are boosting capacity, will be able to meet the expected near-record demand.


+10.5 Million Bbl
+13.0 Million Bbl
+8.5 Million Bbl
+16.0 Million Bbl
+1.5 Million Bbl
+7.1 Million Bbl
+10.0 Million Bbl
LEGEND
5-million barrel increase in cement producing capacity, 1956 to 1959.
Areas where cement shortages held up jobs in 1955-56.
New cement plants built or under construction since 1956.
NEW CEMENT PLANT CAPACITY SINCE 1956

Contractors will use more cement than ever before in 1960, but there'll be plenty to go around.

Since 1955 when spot shortages of cement in many areas held up some jobs, cement producers have invested nearly $500 million to boost capacity from 317,000,000 barrels in 1955 to 375,000,000 barrels this year. They have built 14 new plants and expanded about two-thirds of the existing plants.

Their plans call for continued high expenditure for additional capacity during the next two years. Nine new plants now are under construction, and at least six more will be started during the next year.

This year cement producers are adding 18,000,000 barrels of new capacity and replacing about 9,000,000 barrels of outmoded facilities. During 1959 and 1960, they will push capacity up an additional 27,000,000 barrels to a total of 420,000,000 barrels.

And a lot of this new capacity is located in those areas where shortages of cement pinched most in 1955 and 1956—the Northeast, the South, in Southern California, and in the region around the Great Lakes.

In a period of strong demand for cement, there still may be some minor delays in shipments to

Will Be Adequate

areas like New England where plant capacity is not sufficient to take care of local demand. But there should be no serious delays anywhere.

At planned 1960 capacity of 420,000,000 barrels, cement producers will have ample capacity to meet the record demand of about 370,000,000 barrels. That's a startling figure; in 1956, the biggest year so far, cement producers shipped a total of 306,000,000 barrels.

But it's not hard to find out where the predicted record 1960 demand comes from. Biggest increase will go for highway construction. In 1955, highways took 61,000,000 barrels of cement; in 1960, total roadbuilding requirements will be 110,000,000 barrels.

In addition, there will be a substantial expansion in production of prestressed concrete components of all types. And the normal growth pattern of concrete construction will continue.

This growth pattern has been phenonemal since the end of World War II. Beginning in 1946, cement output rose at an average rate of 19,000,000 barrels a year, setting new production records in each of 10 consecutive years.

Even so, cement producers were caught short in 1955 and 1956 when construction activity was reaching for an all-time peak. If cement manufacturers carry through on their current expansion plans, that's not likely to happen again in 1960.

Steel

There'll be enough steel to keep construction rolling at a near-record rate in 1960. But there won't be much capacity to spare—especially among fabricators of structural steel.

Steelmakers have been spending an average of $1 billion a year for the last six years to boost their total capacity. And a good part of the expansion is in facilities to produce heavy structural shapes.

In 1957, rolling mills produced a record 6,800,000 tons of structural steel. Construction took about 5,000,000 tons of the total.

Since then, steel companies have launched expansion programs that will boost their heavy structural capacity to 8,000,000 tons by next year. That should be enough to supply all demands.

But about 75% of the structural steel that winds up on construction jobs comes from the steel mill through a fabricator to the contractor. In 1956, at the peak of the construction boom, deliveries from fabricators were delayed as much as 18 months. Some jobs were held up; some projects were redesigned to replace scarce structural steel with reinforced or prestressed concrete.

Fabricators say the main reason for this situation was that their allotments of steel from the mills were limited. They point out that shipments of fabricated steel climbed steadily early in 1957 as steel became available in larger quantities. Fabricators shipped a record 4,200,000 tons last year, an increase of almost 1,000,000 tons over the best previous year.

Right now fabricators are in good shape. The drop-off in bookings during the last year has given them a chance to catch up, and they have reduced their backlog of orders from 4,200,000 tons a year ago to a little over 2,000,000 tons. Delivery time is a normal 3 to 4 months on small jobs, not over six or seven months for bigger and more complicated orders.

But bookings have risen spectacularly in recent months. New orders in July totaled 330,840 tons, 55% higher than orders in the same month last year. The sharp recovery in construction activity and the increasing impact of the highway building program seem sure to boost total bookings to near the 1956 all-time high of 4,000,000 tons by 1960.

Can fabricators handle such a flood of orders in 1960 better than they did in 1956? There is no clear-cut answer. The American Institute of Steel Construction says about 85% of all fabricators have increased their capacity to some extent during the last 10 years, but it can't pin down either the total capacity of the fabricating industry today or the amount of expansion planned or carried out since 1956.

The best estimate of total fabricating capacity must be based on the record 1957 shipments of 4,200,000 tons. Some of this output may have been premium priced steel, turned out with overtime or extra-shift labor. So a conservative estimate of normal fabricating capacity would be about 4,000,000 tons.

That's just about on the same level as the expected 1960 demand. If bookings should continue to soar through the first half of next year, a tight situation could develop.

The best judgement now is that capacity in 1960 will be just adequate unless construction activity moves up far faster than anyone can foresee. In some areas of the country—partciularly where fabricating capacity is low—there may be delays; delivery may take up to eight months. But a general shortage of structural steel is unlikely.

New methods of construction will be important . . . on the next page

PLAN 59 FOR WHAT'S AHEAD

Swift Technological Progress Will Provide

Some exciting new construction techniques are under development. The field of concrete construction will see a lot of changes, and 1960 may be the year of the first atomic earthmoving blast. All types of construction will feel the impact of new, improved methods.

The atomic era in earthmoving is scheduled to begin in 1960.

That's when the Atomic Energy Commission expects to set off the first atomic explosion on a construction job. With atomic explosives, AEC believes it can blast out a harbor in one shot.

Right now AEC survey crews are gathering geographical, geological, and oceanographic data along the coast of Alaska north of the Arctic Circle to determine the best site for the history-making shot.

It's a long way, of course, from the first use of such a revolutionary construction tool to the time when it will become important to most contractors. But the likelihood that the first application of atomic energy to earthmoving is only little more than a year away is a significant sign of the technological changes that are coming during the 1960's.

Look what's happened during the last few years. Contractors are building complex structures like atomic power plants and guided missile launching pads; they are paving highways and airfields to unheard of tolerances; they have fired the biggest non-atomic blasts in history, moved dirt faster than ever before, and set new tunneling records.

In the decade of the 1960's technological progress, on all fronts, seems likely to advance at an even swifter rate than it has during the 1950's. The atomic blast AEC hopes to make in 1960 is a portent of the sweeping changes in materials and methods that contractors must expect during the next few years.

It's not going to be a purely U.S. show. Actually the Russians may beat the U.S. to the wire with the first atomic earthmoving blast. Moscow Radio says Russia will build huge tunnels by means of atomic explosives. "in the near future." One project the Russians talk about is a tunnel under the Caspian Sea. Another is a tunnel under the Himalayas.

U.S. scientists believe the USSR may already have fired an atomic earthmoving blast for test purposes. They know that last December the Russians experimented with a conventional blast of 1,000 tons of TNT. This is as big as a small nuclear blast.

It was not until July, 1957, that the U.S. Atomic Energy Commission established "Project Plowshare" at the University of California to explore a number of non-military applications of atomic energy.

AEC set off the first test blast—an underground shot equivalent to 1,700 tons of TNT—two months later. As atomic explosions go, this was pretty small; it was only 1/10 the size of the Hiroshima bomb. But it crushed 400,000 tons of rock and convinced AEC experts that atomic earthmoving is practical.

Biggest problem now is radioactivity and fallout. This would be more of a problem in surface blasting —on a harbor excavation, for example—than it was in the underground test shot. But AEC engineers say they are making good progress in development of a "clean" atomic explosive.

Concrete

In 1960 a lot of contractors will be doing things with concrete that they have never done before.

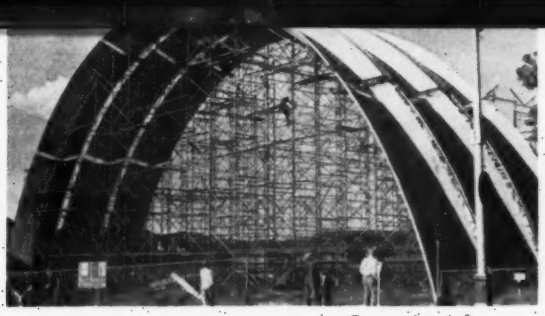
They'll be forming new shapes like hyperbolic paraboloids, casting and erecting thin-shell domes, working with slip forms, operating on-site casting and prestressing beds.

The years ahead will be trying times with many pitfalls, but full of opportunity for alert contractors.

Concrete forming will test contractor ingenuity. New forming materials like plastics and rubber and efficient form design, providing maximum re-use, will be vital as the shapes become more complex.

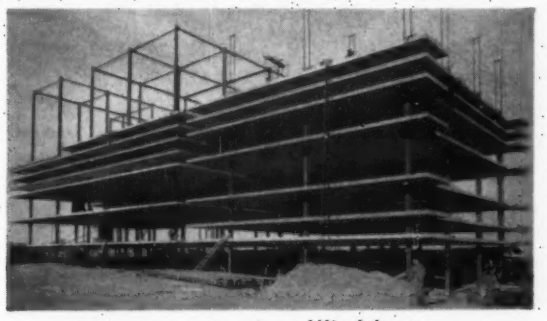
Horizontal slip forming will speed mass production of standard prestressed shapes. In this method one moving form shapes or "extrudes" a stiff concrete mix that holds its shape until it sets. H. H. Edwards, president of Leap Concrete, believes that horizontal slip forming will be in extensive use in the prestressed industry within 5 yr.

Many contractors will find themselves operating on-site prestressing plants. Even though prestressed units will become a standard (you'll order them from catalogs like steel shapes) it often will pay a contractor to produce his own.

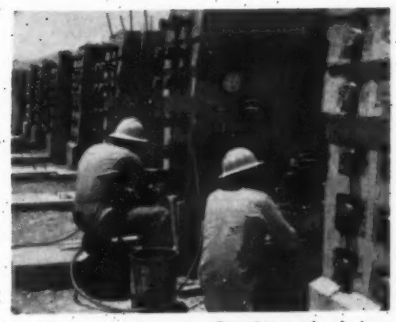


Concrete arch

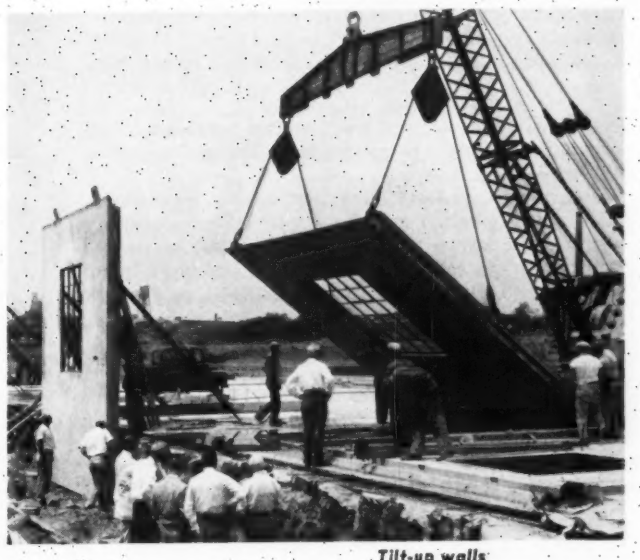
Improved Methods



Lift slab



Prestressed girders



Tilt-up walls

Post-tensioning will account for a small volume of prestressed work, but it may well be the trickiest. It is structurally the more efficient method, and it will be used on bigger structures where each application will present special problems.

Some of the problems that now are handicapping prestressed construction will be overcome in the early sixties. Connections between prestressed members—a perennial headache—will be one of the first problems tackled in the brand new research laboratory of the Portland Cement Association.

Prestressed bridges will become standard on highway construction, at least for the medium spans.

Highway builders can look forward to an even more important development within the next few years—prestressed pavement. This could be the biggest advance in roadbuilding in years.

Prestressed pavement is much stronger than a conventional slab and need be only half as thick. And it doesn't wear out nearly as fast. But can you prestress highway pavement economically?

Engineers at Jones & Laughlin Steel Corp. think you can. To find out for sure, they have set up a test road near Pittsburgh and are experimenting with prestressing techniques. The year 1960 may be the year of the first major breakthrough in highway prestressing methods.

Thin sections and prestressed members in general will require concrete of greatly increased strength. Contractors will be making 7,000-psi concrete in the 1960's as easily as they make 3,000-psi concrete today. But it will take really scientific methods of selecting and mixing ingredients.

Precasting techniques will spread from the south and west, where they are now somewhat concentrated, to all parts of the country. The lift slab method for precasting floor systems on multi-story buildings virtually eliminates extensive formwork. Coupled with precast, tilt-up walls, this method will grow in importance.

The coming construction boom in Alaska will focus attention on cold weather concreting—and winter construction in general. Progressive contractors in the northern states will be solving the problem of uneconomical seasonal fluctuations in work by developing ideas to make winter pouring feasible. The Concrete Industries Board of New York, which has become increasingly aware of the need for cold weather concreting, is working on a set of recommended practices for efficient winter concreting.

The decade of the sixties will see advances in almost all construction techniques. But watch these fields in particular.

- *Pile Driving.* Diesel pile hammers will become popular as some of the baffling problems that have slowed their development so far are solved. Light, fast rigs that can be calibrated easily will replace the cumbersome steam hammers.
- *New Blasting Techniques.* New explosives for conventional blasting and new drill hole patterns are evolving today, will be well established by 1960. Ammonium nitrate type explosives will replace more expensive dynamite on many jobs. Drill holes will be bigger—8 in. or more in dia—and deeper.
- *Soil Testing.* Contractors, especially in the earthmoving field, will become more aware of the advantages of scientific soil testing both in bidding and operations.

Shortages of skilled labor will be a problem . . . on the next page

Too Few Skilled Workers—Even at

The big problem that's shaping up for contractors in 1960 is a probable shortage of skilled workers in particular trades. It could be vastly more costly than the higher wage rates builders will be paying—unless the construction industry acts promptly to beef up apprentice training programs in key trades.

APPRENTICE TRAINING—The Danger Signs Are Out

TRADE	Active Journeymen per Apprentice	Apprentices on Jan. 1, 1957	New Registrations	Completions	Cancellations	Apprentices on Dec. 31, 1957
Bricklayers	12.0	13,982	3,292	1,801	833	14,640
Carpenters	23.2	26,318	5,696	2,531	5,025	24,458
Electricians	6.9	17,672	5,162	3,128	1,965	17,741
Painters, Glaziers	28.0	5,936	1,423	838	1,041	5,480
Cement Masons, Plasterers	13.9	4,031	811	968	410	3,764
Plumbers, Pipefitters	9.5	22,776	4,178	2,564	1,684	22,706
Roofers	7.3	1,624	913	154	415	1,968
Sheet Metal Workers	6.7	11,855	2,818	1,305	1,475	11,893
Structural Iron Workers	17.4	3,685	1,557	458	513	
Not Classified Above		5,621	1,185	765	704	5,337
TOTALS		**113,500**	**27,035**	**14,212**	**14,065**	112,258

Data collected by the Bureau of Labor Statistics from building trades unions in 52 cities

A shortage of skilled construction workers will be a headache for the industry in 1960.

The total construction work force is growing—but not fast enough to keep pace with the increasing volume of construction coming off drawing boards.

Labor shortages will hurt most in the southern and western states because construction activity is expected to step up more rapidly in those regions than in other parts of the country. Elsewhere, it's likely to be a matter mostly of shortages of skilled men in particular trades.

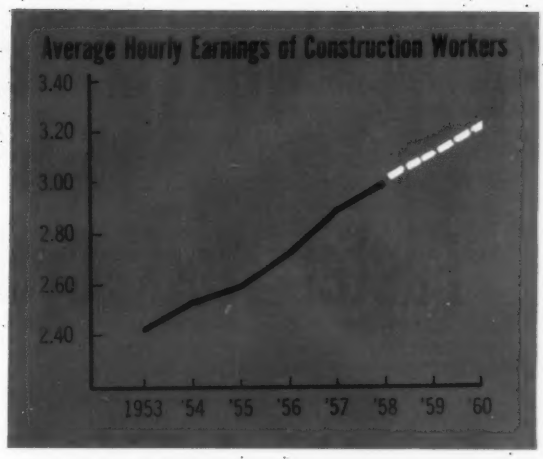
Not everyone agrees on how serious the shortage of construction labor will be. Contractor organizations fear it will cause their members trouble. An official of the Associated General Contractors of America estimates that the construction industry may be shorthanded by as many as 200,000 workers in 1960.

Most union officials take a more optimistic view. They argue that apprentice training programs can be expanded rapidly to meet a clear demand for additional skilled men.

Government experts tend toward the view that labor shortages in most areas and for most skills will not be critical. "The flexibility of the construction industry is astounding," an official of the Labor Department's Bureau of Labor Statistics said. "It has great capacity to develop skills through a combination of apprentice training and on-the-job learning."

Apprentice training is the key to the problem, and here the facts are not encouraging. W. F. Patterson, special assistant to the Secretary of Labor, points out that key trades like the carpenters, iron workers, and plasterers and cement masons are losing journeymen through retirement, disability, or death at a faster rate than their apprentice training programs can replace them.

Higher Wages



Some other trades—sheet metal workers, electricians, and bricklayers, for example—are training apprentices at a rate fast enough to more than make up for their journeymen losses. But the fact remains that a shortage of trained men in any one key trade will cause trouble for the industry.

The one trade most likely to cause trouble is carpenters. There are 1,200,000 carpenters in the U.S. They are the largest single group of skilled workers in the country, and they account for about 40% of all construction labor.

The ratio of apprentice carpenters to active journeymen sounds the warning. The Labor Department's Bureau of Apprenticeship reports that last year there were 23.2 journeymen carpenters for every apprentice in training. That compares with 6.7 sheet metal workers for each apprentice.

As a result, the construction industry is losing journeymen carpenters through death, retirement, or permanent disability considerably faster than apprentice carpenters complete their training. This has been true every year since 1952.

A similar situation—but generally not so bad—exists in some other building trades. There are 17.4 ironworkers for every apprentice in the trade, and losses of active journeymen have exceeded apprenticeship completions in four of the last six years.

There are 13.9 plasterers and cement masons for every apprentice, and losses of journeymen have been higher than apprenticeship completions in three of the last six years.

It seems clear that contractors and unions must do more to beef up their apprentice training programs to get the men the industry will need in 1960.

On the brighter side, there are two new factors. First is the increasing number of private vocational training schools that produce trained machine operators and mechanics in four to six weeks of concentrated training. This is particularly important because the operating engineers have no nationally recognized apprentice training program.

Second is the new "Area Vocational Education Program" authorized by Congress this year. It makes available $15 million of federal money for each of the next four years to help local school boards establish vocational training courses.

Local school boards will have to match the federal money on a 50-50 basis. And there is no assurance that construction trades will be included in local programs unless contractors take the initiative with school boards.

Wages and Productivity

Wage rates in the construction industry will continue to climb. In addition, union pressure for fringe benefits outside the wage structure will increase.

One reason wage rates are sure to continue upward is the large number of collective bargaining agreements that provide for advance wage hikes over the next two or three years. AGC experts say about half the industry's outstanding contracts contain commitments for 1959 pay raises.

During 1957, construction wage scales went up an average of 16 cents an hour; the 1956 increase was 13 cents an hour. And experts expect the wage increases in 1959 and 1960 will be at least as substantial as those of the last three years.

At the same time construction unions will put more stress on retirement pensions, vacation pay, health and welfare plans, and other fringe benefits.

The disinterest of the building trades unions in these fringe benefits is vanishing rapidly. Five years ago, such provisions in construction labor contracts were rare; in 1960 they will be common, even though fringe benefit programs will be more difficult to manage in the construction industry.

How much will increasing labor productivity offset the steadily rising cost of labor? One outstanding authority on construction labor says flatly it's a "hollow hope" to expect any increase in productivity except what can be achieved by improved techniques, equipment, and materials.

But most industry leaders are more optimistic. They bank on the policy statement adopted last February by the AFL-CIO Building and Construction Trades Department. The policy statement said:

"There shall be no limit on production of workmen or restriction on the full use of proper tools or equipment and there shall not be any task or piece work. . . . Slowdowns, foreing of overtime, spread work tactics, standby crews, and featherbedding practices have been and are condemned."

An AGC official points out that this policy apparently is being accepted by union members.

"Union leaders," he says, "have taken a courageous stand on this issue. It has stood the test so far, and we don't know of any rebellion in the ranks against it."

Equipment will be faster, more productive . . . on the next page

PLAN '59 FOR WHAT'S AHEAD

Faster Work Cycles Boost Output

More power and better controls will boost production without increasing the size of equipment appreciably. As the horsepower race continues, the diesel will remain the basic construction power plant. Tires are getting better but more specialized.

The big equipment problem in 1960 will be to get higher production from smaller machines.

For tractors, trucks, and scrapers, this means more power and higher speeds; for shovels, it means better, faster-acting controls; for batch plants, it means faster weighing and mixing cycles; for crushers, faster screening techniques; for graders, better blade control.

All down the line, manufacturers will concentrate on reducing cycle times so that the contractor gets more work per hour from a relatively small piece of equipment.

Then is R. G. LeTourneau's 50-yd scraper a freak? No, say leading equipment designers. There is a definite place for a machine of this capacity, but it won't become the average contractor's workhorse.

Why not? For the same reasons that the size of all construction equipment is limited. A machine of this size has to stay put—and stay producing—before it can earn its keep.

The major drawback to giant machines of all types is lack of roadability. A shovel manufacturer, who predicts that the 2½-yd machine will still be the most popular shovel in the 1960's, says: "The average contractor's job lasts from three to six months. If he tries to put an oversized machine on jobs of that duration, he'll wind up paying for the rig over and over again in transportation costs."

But there is a developing market for the big, specialized machine. Its place is on those jobs where the right combination of conditions exists. The prime consideration is a long-term project where high production is a must.

But the average contractor still demands equipment that he can move easily and inexpensively. Capacity will increase, but not because machines are becoming giant size. For example, scrapers will get larger gradually, but don't expect any startling jump in bowl capacity.

The last five years have seen an across-the-board improvement in equipment design. In a short rush, torque converters, tubeless tires, automatic controls, turbocharged engines, and a host of other developments have made their appearance. There also have been major breakthroughs in metal alloys, drive-train design, hydraulics, and ease-of-maintenance procedures. It is from these developments that higher production will come.

How will earth be moved in the late 1960's? Just as it is moved now, according to the experts. Scrapers and shovels and trucks will continue to be the main production tools.

Which method will predominate? Scraper designers tell you that there has never been a higher production machine for earthmoving than the scraper. They point out that scrapers now can do jobs they could not handle five years ago. Scrapers now tear into ground that was strictly the shovel's—and in some cases, the blaster's—domain a few years ago.

When practical rear-wheel assist becomes a reality, they say, pusher requirements will be lessened. They point out that engine design advancements have enabled them to give their machines the power to lower cycle time. And they say recent bowl designs enable scrapers to carry more without increasing the over-all size of the machines.

On the other hand, shovel men say recent design improvements have shortened cycle time to the point where the major problem is to find enough trucks to keep up with the shovel. Effortless controls and stronger steel alloys, sintered metal clutches, and torque converters reduce maintenance problems considerably.

Horsepower race

Scrapers, shovels, trucks, and just about every

R. G. LeTourneau's giant scraper

other type of mobile equipment will soon get another power boost. The horsepower race is still very much with us.

Why a power race? One designer says: "There is no horsepower battle among manufacturers. The race is between the manufacturer and the contractor. We give the contractor a machine with enough power to do its job. He overloads the machine and demands that we add more power. We put in more power, he overloads the machine again, and the race is on."

Another designer says bluntly: "The horsepower race is far from over. Within a few years, earthmoving equipment will be powered by 1,000-hp engines. As long as manufacturers build more powerful engines, compact enough for mobile equipment, machinery manufacturers will produce rigs to utilize this power."

What about power plants? Is the diesel to remain the mainstay of the industry, or is it soon to be replaced by "exotic" engine types—gas turbine or free-piston power plants? The diesel will remain the king for a good while, say both engine and equipment designers.

But right now at least two manufacturers are testing gas turbine engines in big crawler tractors. And a shovel manufacturer says the day is not far off when big excavators will be powered electrically by gas turbines and generators.

In theory, the gas turbine engine offers interesting possibilities of high horsepower at low bulk. But before it can be applied to construction equipment it will have to be developed to the point where it can be started easily in all kinds of weather and where performance characteristics and load economy are comparable to diesels. It may be that special transmissions will have to be developed first. At the present time the gas turbine engine does not have the range and flexibility of power that earthmoving operations require.

Improvements in diesel engine design will make it more and more difficult for the gas turbine or free-piston engine to be competitive.

Engine manufacturers call the turbocharger the diesel engine's lifesaver. In fact, one manufacturer insists the turbocharged diesel is the first of the "exotic" power plants because it is really a compound engine—a combination of a turbine and reciprocating engine.

If it were not for the turbocharger, the diesel might well have reached its practical limits as an earthmoving engine. Demands for more visibility and balance mean that the engine cannot get much bigger. It also cannot get much heavier, consume more fuel, or become more expensive.

You add far less bulk to an engine with a turbocharger than if you beefed up the entire engine to get a comparable power increase. A turbocharged diesel in the 160-hp class weighs about 1,000 lb less than its naturally aspirated counterpart. It follows in engine design that the lighter and smaller the engine, the cheaper its initial price. And the turbocharged engine has the lowest specific fuel consumption rate of any diesel.

The turbocharger itself offers opportunities for further improvement. In the beginning the turbocharger was a power-boosting accessory, not an integral engine part. Often it was mismatched with the engine and other drive-train components.

But recently, exhaust and intake valve design has been improved to accommodate large quantities of air and to remove exhaust gases faster. Valve seats and exhaust valves made of newer metals minimize the corrosive effect of high temperature gases, and more attention is given to the air filter system—a critical component on a turbocharged engine.

But important modifications remain to be made in turbocharger design. Better rotor and nozzle design, for example, can make for less lugging throughout the entire load range by increasing the turbocharger's acceleration rate.

Through the mid-1960's at least, turbocharging will continue to be the way to meet the contractor's demand for more and more power. Peter Kyropoulos, General Motors engine expert, says: "The day will come when a turbocharged engine will produce 1 hp per cu in. of displacement. We can predict a General Motors 6-71 turbocharged engine weighing 1,600 lb with an output of 400-450-hp at 2,500 rpm. Fuel consumption will be in the neighborhood of 0.375 lb/bhp/hr."

With other diesel manufacturers making similar strides throughout the whole power range, the "exotic" power plants remain engines of the distant future.

Machine materials

Designers choosing materials for construction machinery in 1960 will continue to work toward two goals—high strength and low weight. The trend definitely is toward more power per pound of machine.

It is just recently that construction equipment

Koehring's fast-loading Skooper

Goodyear's high-flotation tires

PLAN '59 FOR WHAT'S AHEAD

PRICES, PRODUCTIVITY RISE . . . continued

manufacturers have been able to use lightweight, high-strength alloys in place of cast forgings and heavy plate steels. Now it is practical to use more expensive alloys because they either lower the cost per yard of capacity, increase the range of a machine, or provide needed added strength.

The development of new lightweight steels is mainly responsible for bigger truck cranes. With these steels in frames and booms, truck crane manufacturers are able to build bigger machines and still meet state weight limits.

For scrapers, the elimination of weight means that the rigs can work in a gear range one or two steps higher than formerly. This reduces cycle time considerably.

For all types of equipment, manufacturers are putting weight only where they need it. They are replacing heavy cast-iron forgings, riveted structures, and heavy steel plating with all-welded box beams and channels made from the new steel alloys.

For those applications where weight is not a prime consideration, the new steels have proved of value because of their great strength. One of the most popular of the new alloys, U.S. Steel's T-1, is 20% to 40% stronger than most carbon steels.

Another breakthrough has been made in heat-treated steels. Used almost universally now for components subjected to heavy wear, these steels reduce the size and weight of parts while greatly increasing their strength (up to 100% in some cases).

What will be the basic metal for construction rigs in the late 1960's? Steel will continue to replace iron castings; aluminum will make some inroads.

Several companies are manufacturing big aluminum rear dump bodies—up to the 34-yd class—for specialized mining applications, notably for handling bauxite. Aluminum bodies for handling aggregates are also making their appearance. These bodies weigh about 40% less than steel bodies of comparable size. For bodies used in over-the-road service, aluminum has a bright future.

Other recent applications of aluminum are for materials-handling clamshell buckets, hoists, pump casings, and scaffolding. One notable application is the use of aluminum for engine components.

A heavy equipment designer predicts the day is coming when aluminum will replace sheet steel in just about every application where weight is a consideration.

As equipment grows in size and power, drive-train components and brakes become subject to more and more wear. Great improvements will continue to be made in lining and facing materials. The introduction of ceramic and sintered metal linings for brakes and clutches on all types of construction equipment reduces down-time considerably. Shovel and crane manufacturers, especially, are speeding cycle time and capacity, thanks to the new clutch materials.

The use of tougher materials enables crawler-mounted equipment to perform jobs that were off limits a few years ago. New track shoes contain a high ratio of manganese and they actually work-harden under severe job conditions. Shoes with from 10% to 15% manganese cut track wear on jobs where constant pounding and shearing are problems. Hardened steel rollers and sprockets also boost crawler applications.

Tires

One way to increase production with earthmoving equipment is to shorten cycle time. Shorter cycle times mean higher speeds and higher speeds demand good tires.

Three words sum up tire improvements of the past few years—nylon, widebase, and tubeless. These developments have had a startling impact on the entire earthmoving industry.

Tire design in the next two years will concentrate on consolidating these recent developments. But in the late 1960's tires may change shape completely—at least for some specialized applications.

Goodyear Terra-Tires show promise. Almost rubber bags, they travel at extremely low pressures. Flotation characteristics are outstanding.

Four-Wheel Drive Co., under a research and development contract for the Air Force, has produced a missile support truck with Goodyear Terra-Tires that weigh 16,000 lb and carry a 16,000-lb payload at speeds up to 45 mph. This unit can climb a 60% grade with a full payload.

Another development that the military is considering is variable-pressure tires. This would be an ideal way to combine flotation and traction characteristics as they have never before been combined. It would allow any operator, from his cab, to vary air pressure in each tire while the vehicle is in motion. This would give him the footing he needs under various conditions.

The rubber industry is working on new tread compounds.

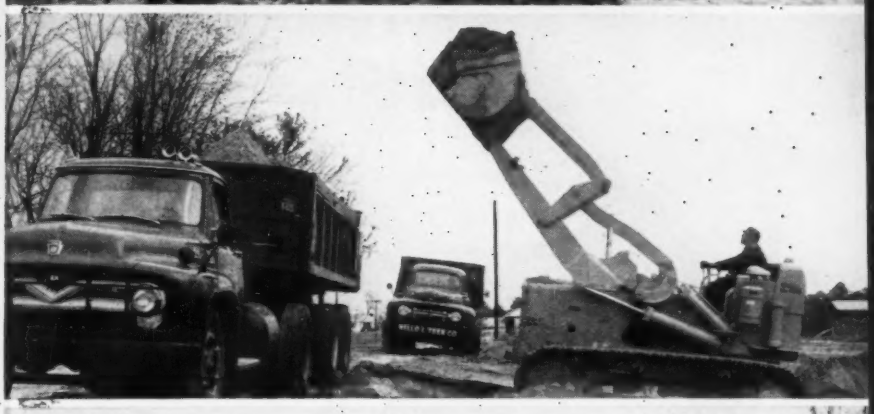
continued on page 107

In 1958 contractors will buy $1.7 billion of new equipment, second only to 1956's record high of slightly over $1.8 billion. In 1960, contractors will spend $1.9 billion and shortly after that annual sales will reach $2 billion for new equipment and parts.

Manufacturers are confident they can meet this demand. For the immediate future, only one black cloud appears on the horizon. If contractor purchases next spring should spurt even a little above present manufacturer sales estimates, there are likely to be shortages of some types of equipment. This is because manufacturers will keep production this winter at what they call a "reasonable" level for fear of being caught with big inventories. They believe their estimates of next spring's demand are accurate; but they thought the same thing last year when they over-produced and filled their yards with unsold equipment.

Should spot shortages occur, manufacturers will be quick to increase production. With their expanded capacity, this means that any shortage will be short-lived.

LOOK AT THE No. 977 LOAD OVER 18 TONS IN 4 MINUTES— ALL DAY LONG!



This is a road construction job between Durham and Chapel Hill, N. C. Loading sand for Nello L. Teer Co. is this Caterpillar No. 977 Traxcavator, averaging 18.4 tons per load. Its load time per truck is 4 minutes, timed right on the job. Supt. R. G. Moore states flatly: "Best truck loader there is."

A few reasons: the No. 977's track roller frames are extended for better stability; its 2¼ cu. yd. bucket tilts back 40 degrees at ground level, giving leverage at the cutting edge and preventing spillage; operator sits high and comfortable, out of the dust, with all controls conveniently at hand.

New with the No. 977: a Side Dump Bucket attachment (2¼ cu. yd.) that dumps to the left as well as forward and is directly interchangeable (same pins, bolts, nuts) with the standard bucket.

But don't just look at pictures—look at the dirt fly on your own job when a Cat No. 977 Traxcavator digs in. Call your Caterpillar Dealer right now and set up an eye-opening, truck-filling demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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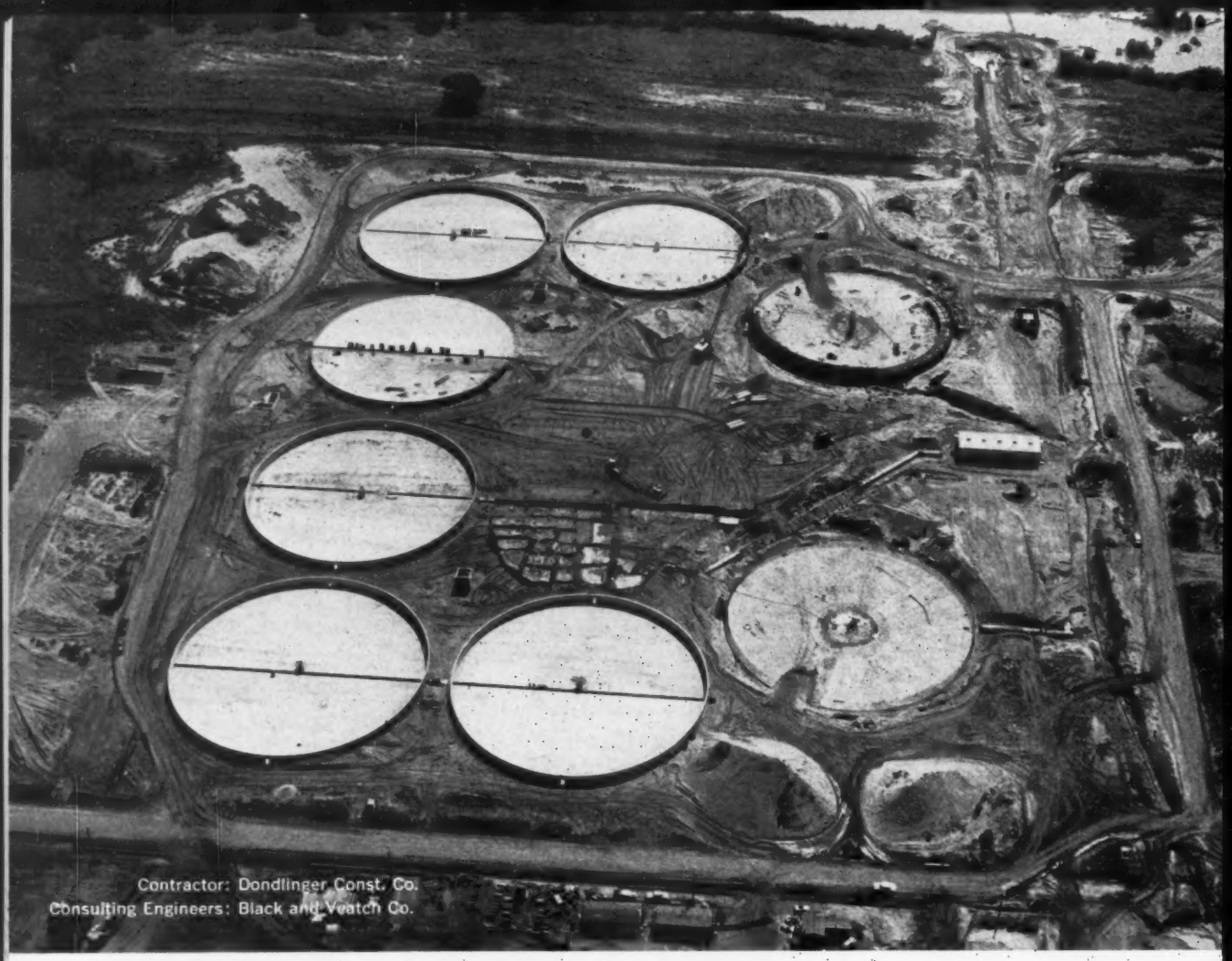
LOOK FOR YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

FOR FAST LOADING



Contractor: Dondlinger Const. Co.
Consulting Engineers: Black and Veatch Co.

STANG WELLPOINTS DEWATER 15½ ACRES FROM ONE CENTRAL PUMPING STATION

Good imagination, the best equipment, and sound engineering paid off in time saved and a job well done, in dewatering the site of the City of Wichita, Kansas' new secondary sewage treatment plant. A scant 300' from the high stage Arkansas River, water of the total area was controlled by a single stage wellpoint system and one central pumping station consisting of three 12 x 10 Stang wellpoint pumps—**in spite of a 20.5' average riverhead and a 7½" rainstorm.**

The advantages of this approach were many. In addition to the obvious saving of time, the system required fewer operators, much less maintenance, and afforded a flexibility that gave the contractor complete control, allowing him to control the water table in separate areas of the job all from one point.

For an efficient, time and money-saving answer to your next water handling problem, see Stang first. They're first in engineering, first in equipment, and first in service. Contact them now.

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PLAN '59 FOR WHAT'S AHEAD

FAST CYCLES BOOST OUTPUT . . . continued

This is a problem. The development of new tread compounds that will produce and hold less heat is one answer. But, as one tire expert points out, there is a limit to the degree that heat build up can be controlled by compounding alone. And, he says, the first consideration for construction tires must be the ability to withstand the rough service.

"It might be that we need a line of specially compounded, thinner and lighter tires when heat resistance is the prime requisite; then a tire with a heavy tread for jobs where heat build-up is not a problem; and finally a standard, medium-tread tire for average jobs," he says.

Controls

It took equipment buyers, and manufacturers, a long time to realize that semi-automatic and automatic controls do a lot more than just make things easier for an operator. They also enable him to do his job faster, with fewer mistakes, and with less help.

Automatic controls have really paid off in asphalt and concrete batch plants because they enable manufacturers to boost production while reducing plant size.

Only the larger batch plants are electronically controlled now; by the mid-1960's, many smaller, mobile plants will have electronic control systems.

As mobile generating systems become more efficient, dependable, and compact, manufacturers are showing renewed interest in electric power. Some recent applications include electrically heated hot-oil systems for asphalt plants; electrically controlled vibrating compaction equipment; electrically controlled screeds for asphalt pavers; and electrically widening concrete spreaders.

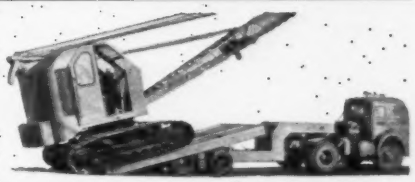
The latest important use of electric drive is to power R. G. LeTourneau's giant scraper. This machine has a 600-hp diesel engine that powers ac and dc generators with a combined output of 700 v. Each wheel of the scraper contains its own dc motor.

The development of compact hydraulic systems to transmit power has had a tremendous impact on construction equipment; they will continue to dominate as controls for mobile equipment.

Hydraulic design has improved tremendously in the past few years. Pumps now have greater speeds, pressures, and work capabilities.

The hydraulic industry is still working on two big problems. There is a need for improved, high-capacity hydraulic filters that are light and compact. Present by-pass type filters are inadequate, experts say. There is also a need for better flexible hose to carry constantly increasing volumes at high pressures.

A well-run front office will pay a profit . . . turn to page 111



NEW OTG
MILLER Tilt-Top
15 TON capacity for:

- Insley K½ Hoe/dragline
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- Allis Chalmers HD 11-G
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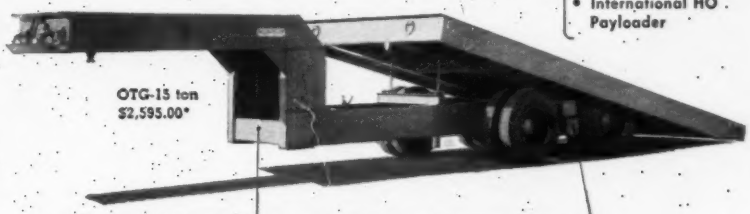
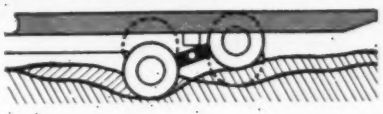


OTG-15 ton
$2,595.00*

with GOOSENECK tongue and TANDEM AXLE

Heavy box section walking beams oscillate freely on each side—permit each set of tandem dual wheels to rise and fall independently . . . assuring less jarring, less frame strain and a more level ride over rough terrain. Timken roller bearings on walking beam shaft and axles assure positive alignment . . . minimum maintenance.



Here is all the speed, convenience and safety for which MILLER Tilt-Tops have gained wide acceptance . . . engineered into a big 30,000 lb. capacity, gooseneck Tilt-Top. Any one of the heavy equipment pieces listed above, and many others, can be loaded by ONE man in just TWO minutes. The OTG's massive platform measuring 8 x 16 ft. — 20 ft. long if desired, provides all the room you need for big rigs. Built like a bridge underneath, it's topped with 2 inch, traction-sure oak . . . yet is balanced like a watch . . . tilts under a man's weight for loading. And the platform pivots further back than competing tilt trailers . . . permitting lower platform height without a troublesome "beaver tail" ridge. Why bother with slower loading, more awkward trailers any longer — see this production booster at your MILLER distributor today!

*F. O. B. Milwaukee, Wis.
Complete with platform and tires
Brakes and optional equipment extra
*Plus 10% Federal Tax.

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Outside Camarillo, Calif., U. S. 101 is being relocated and improved. J. E. Haddock Ltd. is handling 5-mile project, moving a million and a half cu. yd. — mostly rock. Haddock moves about 7,000 cu. yd. a day.

Four CAT D9 Tractors are on the job here, along with five D8s, three No. 12 Motor Graders; three DW21s with Scrapers, three DW21s with Athey PR21 Wagons, and a D13000 Caterpillar Diesel Engine.

Two of the three Caterpillar DW21 Tractors with Athey PR21 Wagons loading up for another fast rock haul on U. S. 101 project. Conditions like this explain why Project Supt. Saul says he picked Caterpillar for its "ability to do the tough work."

Athey PR21, teammate of DW21 Tractor, can haul 34 tons of rock or other material efficiently. On this job it hauls about 18 cu. yd., making 1-mile round trip in about 12 minutes—against a return grade of 12% in places.

RELOCATING U. S. 101

"This job is plenty tough. We called on Caterpillar-built equipment for this one. We get good service with very little down time—and then our Caterpillar Dealer goes all out to see that our machines are back at work as soon as possible."

Project Supt. Neal Saul's words should ring a bell for you, too. See *your* dealer for the machines that handle the tough jobs in stride. See him for replacement parts you can trust. See him for the fast, thorough service that keeps your machines making money.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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WHEN THE JOB IS PLENTY TOUGH

D9 with No. 9S Bulldozer moves rock in a hurry. The LOAD SHAPE No. 9S is a 14-ft. blade with a cutting edge made of "Hi-Electro" hardened steel. A push cup mounts easily, right onto the blade, when desired. The D9 delivers 320 HP at the flywheel. With its optional three-stage torque converter, the D9's output is automatically matched to the load.

Here is the BUTLER PLANT with which Denton Construction Company set a new world's record.

WORLD'S HIGHWAY BATCHING RECORD!

IN ONE DAY 6,029 LINEAL FEET

This is a record announced by the Michigan State Highway Department on behalf of Denton Construction Company

• Paving time	12 hours
• Batching production	2,968 batches
• Cement consumption	5,800 barrels
• Paving Production	6,029 feet *(length)* x 24 feet *(width)* x 9 inches *(thickness)*
• Square yards	16,077
• Cubic yards	4,019
• Number of pavers	Three 34E dual drums
• Number of batching plants	One BUTLER TX-4
• Site	U. S. 23 near Dundee, Michigan
• Contractor	DENTON CONSTRUCTION COMPANY

Do you want to know more about the BUTLER TX-4 and its versatility in production? Just write "TX-4" on a postcard with your name and address. We'll rush complete details immediately.

Notice that 3 pavers were used. The BUTLER TX-4 can readily satisfy 4 dual drums. What would the record be if 4 pavers had been on that job?

But interestingly, the BUTLER TX-4 is efficient and economical where a job requires only ONE PAVER. Just a matter of the number of batchers and their arrangement.

BUTLER BIN CO.

949 Blackstone Avenue • Waukesha, Wisconsin

PLAN 59 FOR WHAT'S AHEAD

There's Profit in a Well-Run Office

Good organization is just as important in the office as on the job. An efficient office often makes the difference between pocketing a profit or taking a loss.

Most contractors are pretty good at organizing their field operations. Unfortunately, many aren't nearly as sharp when it comes to the less exciting business of setting up efficient office systems.

It's an inescapable fact, though, that what goes on in the office often determines how much profit a job will show. There's a steadily increasing amount of clerical work to be done. And clerical costs are higher every year.

The solution is exactly the same in the office as in the field—mechanization. Since World War II, there's been a revolution in paperwork processing. Today there are a host of new machines and ideas to speed office work.

No industry needs these new techniques more than the construction industry. A good office setup will produce savings in payroll processing, better control of orders and payments for materials, and equipment records that tell a story of actual costs.

To outsiders it's amazing that contractors are so sloppy in the office. Here's the way an executive of a bonding company put it:

"Experts cite case after case of contractors whose accounting records are so inadequate that they don't know themselves when they are in trouble. Payments from one job are mingled with another, liabilities are calculated haphazardly, profits are only a guess. Their constant hope is that work under way will somehow bail them out. Two losses back to back, and another contractor is out of business."

W. A. Abrahamson of Morrison-Knudsen cites a survey showing that "only one contractor in ten keeps records of the costs of owning and operating heavy equipment . . . this in spite of the fact that proper use of equipment often is a measure of the contractor's ability to survive."

What to Do

The first step, of course, is to make a thorough study of the present office setup. What type of information should it produce? How fast do you need it? What kind of work can you cut down or eliminate?

These must be top management decisions. The best office system and the most expensive machines won't do an efficient job until management can spell out in detail exactly what job is needed.

More often than not a thorough analysis will show that mechanizing certain office operations will achieve important savings by cutting down on expensive clerical work. Almost always the analysis also will show that a mechanized operation will give better, faster, more accurate control of job costs.

One of the first things to look for in an analysis of any office system is how much duplication of paperwork is there. Departments like to be independent, develop their own system. This often is wasteful for the company as a whole.

Labor costs, for example, go out to the field, to payroll, to cost accounting, and to estimating. Each may want the data in a slightly different form, but the information basically is the same. So why have four or five different ways of compiling this information?

Another thing to watch is the kind of information people ask for and what use they make of it. Some large companies tend to collect too much information and prepare too many reports. A lot of it may be unnecessary—but it's expensive.

Smaller companies, on the other hand, tend to have too little information available for effective operations. Many lack a good system of cost control that could pay for itself many times in improved field operations.

Efficient design of standard forms offers an important opportunity for cost cutting. The cost of a completed form may be 100 times the cost of the blank form. So it is important to put on the form only what is necessary. Maybe it would be more efficient to split a long form into two forms. In other cases it would be faster to reverse the process and combine two forms into one.

Copying of forms and drawings is expensive and time-consuming. If a contractor finds that he has a significant amount of this work to do, it probably would pay him to install some sort of copying machine. For the small volume work normally required in an office there are a number of these machines available with a wide range of capabilities.

For drawings, microfilming techniques seem to be among the more promising of the new developments. Drawings recorded on microfilm can be projected in a viewer for study or reproduced as regular drawings for field use. A microfilm system eliminates bulky, flat files for storing drawings.

What Kind of Machine

When a contractor decides to mechanize his accounting and data processing system, the most im-

PLAN 59 FOR WHAT'S AHEAD

THERE'S PROFIT IN A WELL-RUN OFFICE . . . continued

portant decisions he will have to make are on what kind of equipment to buy. Data processing machines are expensive so it is important to make the right decisions. There are a number of good machines on the market.

There are no fixed rules for selection. Don't be afraid to shop around and spend plenty of time finding out exactly what you want the equipment to do. Keep in mind future needs. In most offices, the tendency is to build an integrated system using the machines of one manufacturer.

Data processing machines fall into three major groups.

Most important are the electro-mechanical calculators. These are powered by electricity and generally (though not necessarily) operated manually. They perform arithmetic calculations and the internal processing is mechanical—gears, levers, etc. Some of the advanced machines of this type are extremely fast.

The vast majority of office machines fall into this group. At one end of the scale are the adding machines and desk calculators common to most offices. At the other end are the large accounting machines that grind out payrolls and invoices semi-automatically at great speed.

Computers

The second big group includes the electronic computers. Computers are complex, do their calculating by electronic impulses rather than mechanical devices, and work at almost unbelievable speeds.

Aside from their speed, their biggest advantage over mechanical machines is "memory"—the ability to store within the machine facts, instructions, previous results, and other information that enables the computer to perform very complicated computations automatically.

So far, contractors have not found computers economical.

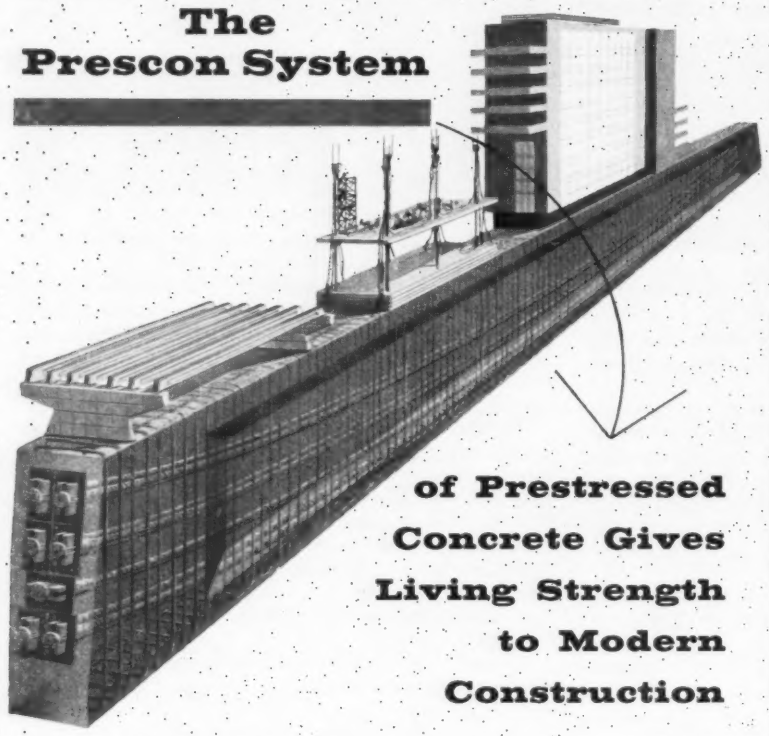
Most office mechanization in construction firms has centered around some type of mechanical machine.

However Stanford University has set up a study group to find out how computers can speed construction work. They hope to find ways of cutting costs on repetitive operations like dredging, pile driving, and concrete placement. This may open the field for construction computers in the future.

The third major group of data processing machines are those involving punched cards. Strictly speaking, these are not calculators, but tabulators. You could call a punched card system a specialized type of filing system. The cards record information, classify it, and deliver it in any order required. They often are used to feed information into calculators and are usually part of any highly mechanized office.

continued on page 115

The Prescon System



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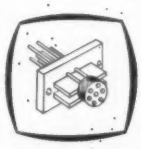

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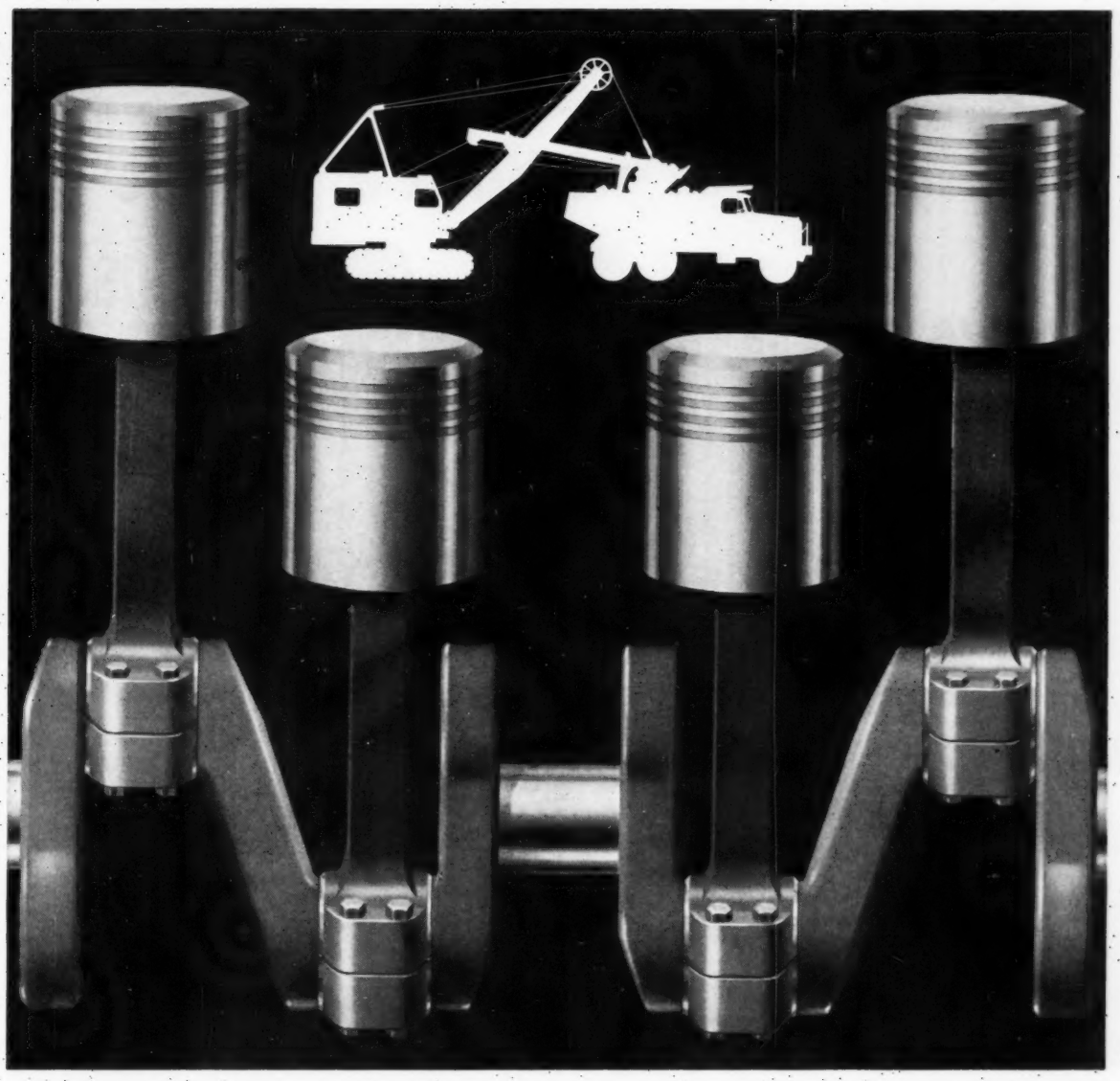

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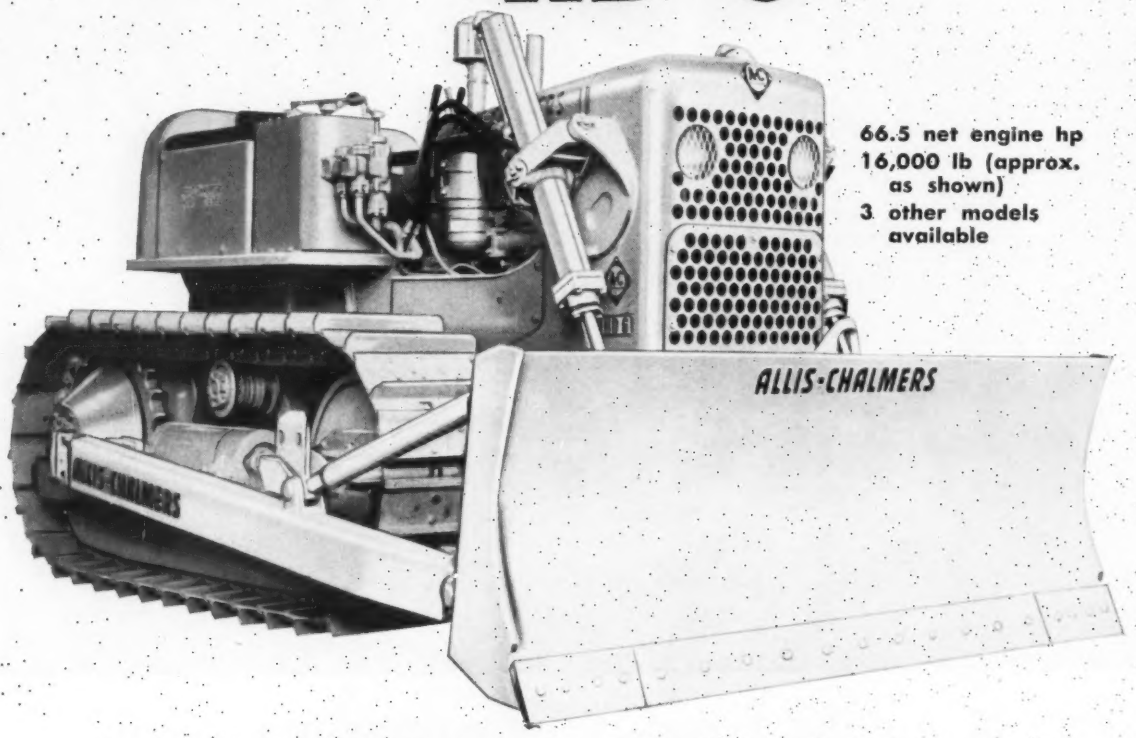

66.5 net engine hp
16,000 lb (approx. as shown)
3 other models available

Contractors find the Allis-Chalmers HD-6 measures up — both in performance and easy transport. It has the size, power and dependability to make money on all your earthmoving jobs.

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There are many reasons why more and more contractors are using HD-6 dozer tractors. See your Allis-Chalmers dealer. He'll be glad to demonstrate on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

PROFIT IN THE OFFICE . . . continued from page 112

Central Office Handles Payrolls

F. H. McGraw Co. has an accounting center in its main office that figures payrolls for all McGraw jobs. An important byproduct is cost data that lets management spot trouble fast.

F. H. McGraw & Company of Hartford, Conn., is one of the first construction companies to install an advanced type of data processing center.

McGraw set up a group of IBM (International Business Machines Corp.) accounting machines at their home office to handle their large payrolls. As a very important byproduct they get weekly reports of exactly how their money is spent and how expenditures compare with advance estimates.

These weekly reports enable the company to spot trouble right away and correct it before it gets serious. At the end of each month the machines make up a revised estimate for the remainder of the job so management can compare progress with the original estimate.

McGraw's setup is based on the idea that labor costs are the only important variable on a job. They figure that if they can keep on top of labor costs they have the job under control. Of course the machines give them fast, accurate control of material and other costs, too. But primarily they are set up to handle the payroll.

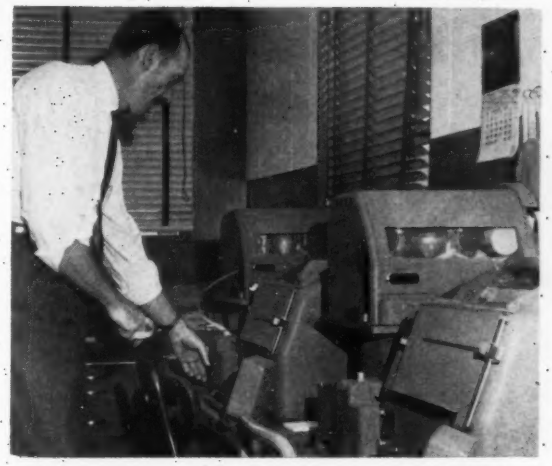
The accounting machines are centralized at McGraw's Hartford office. Data comes in from field jobs over leased wire services.

The machines do the calculations and come up with the weekly payroll list. Then they send it back to the field office via teletype. All the job engineer has to do is insert a roll of blank checks at the receiving end. A tele-printer automatically prints the pay checks for the week.

The central office handles most small and medium size jobs. On big jobs, like the Paducah, Ky., atomic plant where 23,000 men represented a weekly payroll of $2.5 million, McGraw sets up a complete processing center on the job.

The first step on any job is to break down the contract into each type of costs and assign an accounting number to each. A copy of this breakdown goes to the job engineer.

Each day the foremen turn in time cards containing the usual payroll information—names, time worked, etc.—plus a statement of what work each man was on. The job engineer adds the cost accounting numbers and shoots the whole works off to Hartford by teletype.



NERVE CENTER — Teletype machines receive data from the field, relay processed payrolls back to each job.

At Hartford, a special machine transfers the data from the tape to punched cards. Accounting machines figure totals, deductions, and amounts owing each man. At the end of the week the cards are sorted by machine to obtain weekly pay cards.

A machine writes the payroll register from the cards. Another machine transfers the information to teletype tape. At the field office a receiving teleprinter automatically prints the checks.

When the payroll is complete the cards at Hartford are resorted through the machines, this time to give the labor costs for each item of the cost accounting system. The results show how much labor went into any particular segment of the job.

Normally this is done every week. But if a situation looks bad and a crash program is indicated, the system can get daily reports of costs on the teletype to the field men.

The main purpose of the system is to control labor costs. But McGraw gets several byproducts.

First, the teletype system allows them to put the full resources of their central engineering staff to work on even a small problem on a remote job.

Also, the system handles material costs. This is a separate operation but is run the same as the payroll. It handles accounts payable, keeping track of amounts and dates. This helps McGraw accountants to maintain the proper cash requirements and to take full advantage of discounts.

The summary of both labor and material costs on IBM cards forms a library of figures that can be used for additional reports such as monthly revised job estimates, data for estimating future jobs, and the final report that indicates the exact profit on a job. Cost data from previous jobs also helps determine such questions as when it is profitable to set up a concrete plant on the job.

continued on next page

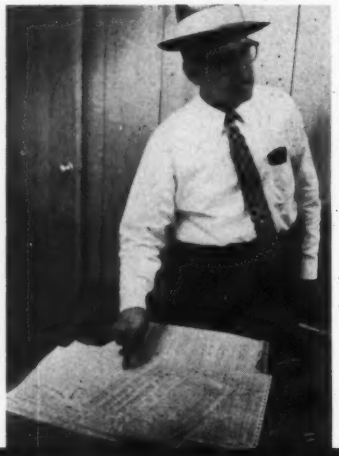
PROFIT IN THE OFFICE . . . continued

Machines Speed Cost Accounting

A Texas outfit eliminated much of the guesswork from cost accounting by equipping their offices with data processing machines.

SORTING — Automatic machine sorts punched cards to compile the data for weekly payroll and job cost reports.

PRINTING — Another machine prints results from cards onto report that summarizes costs for the current week.



RESULTS — Up to date reports allow management to spot trouble fast, correct a situation before it gets out of hand.

Remove the risk from heavy construction? That day hasn't come yet. But J. E. Morgan & Sons, a Texas construction outfit, figure they have removed 20% of the pure risk element from their business by installing a mechanized system of cost analysis.

Harold A. Morrissey, Jr., manager of accounting services for the company, is enthusiastic about the new system. He says: "We've developed a realistic base for bidding on new jobs that gives us both reasonable assurance against bidding too marginally and against bidding higher than necessary to make a profit or get the business.

"Until two years ago, when we first installed our system, one of our major hazards was the time it took to assemble adequate figures for meaningful cost analysis.

"By the time we learned our costs were too high on a certain phase of a job, that phase was either already completed or so far along that a sizeable chunk of money that should have been profit already had disappeared."

The system of machine accounting removes the hazard. It gives Morgan a weekly report summarizing costs to date. The report spotlights potential sources of trouble and gives management a chance to move in fast to get it under control.

There is nothing radically new in the cost accounting methods. The startling thing about the system is the speed at whcih the machines produce finished data.

The set up is similar to F. H. McGraw's. All the machines are IBM. But Morgan does not operate on such a large scale. They have two data processing centers, at Dallas and El Paso, that handle only local jobs.

Byproducts

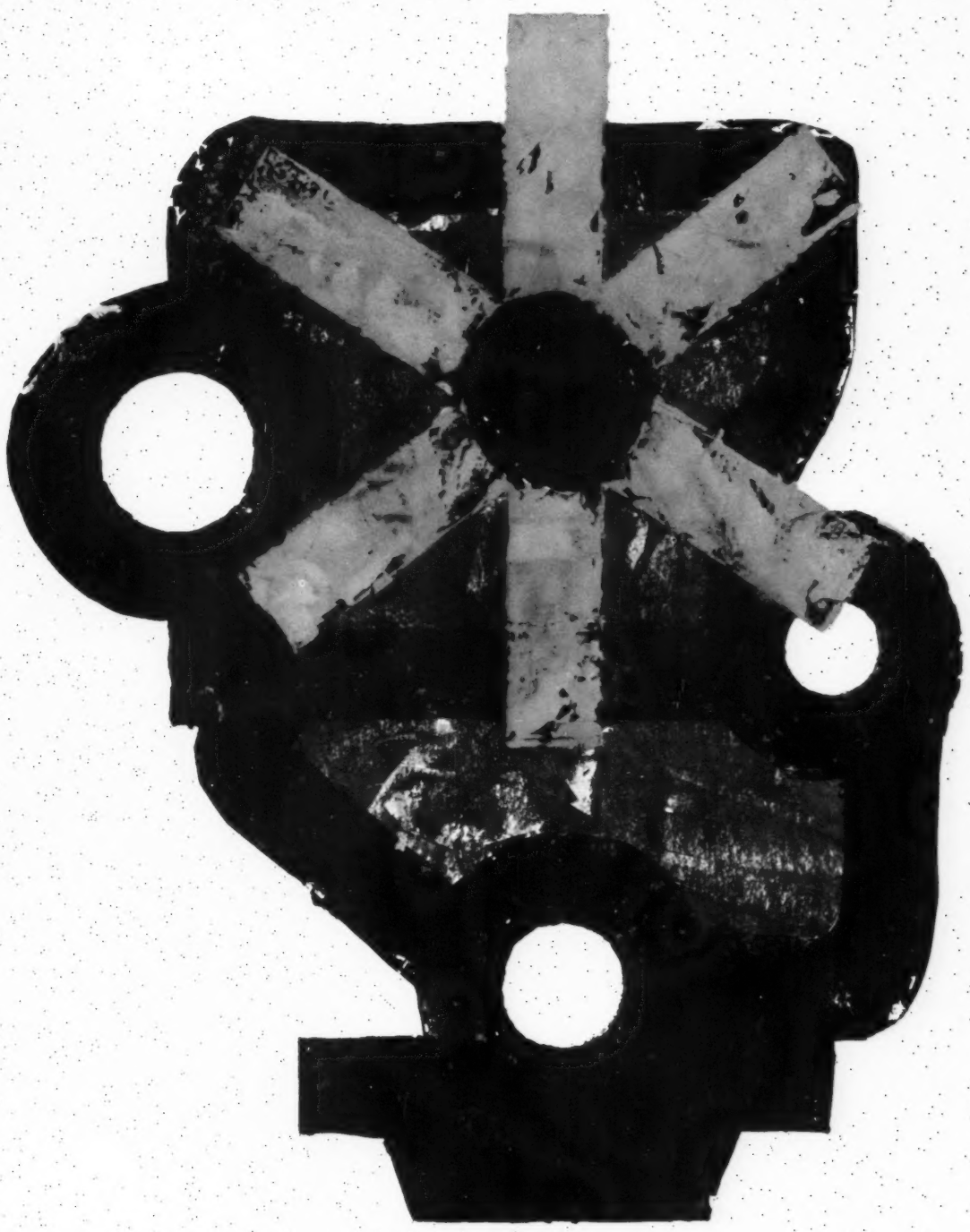
Unlike the McGraw system, Morgan set theirs up with the primary function of keeping cost accounting up to the minute. Any other information they develop is strictly a byproduct.

One of the byproducts is the weekly payroll that is required of a contractor on government jobs. This payroll has to prorate social security and other items according to the hours worked on the particular government job. This takes a lot of calculating.

Morgan estimates that this job would require two people working full time to do it manually. The IBM equipment does the job approximately in one hour.

"To say that we have actually removed the risk from our business would be a great overstatement," Morrissey says, "but we are confident we are providing ourselves a more solid foundation from which to work. We can say this because it shows up in our profit record. In this competitive age, the construction company that hopes to stay in business can ill-afford guess work where something better is available."

Today's machines promise greater productivity . . . story on page 120



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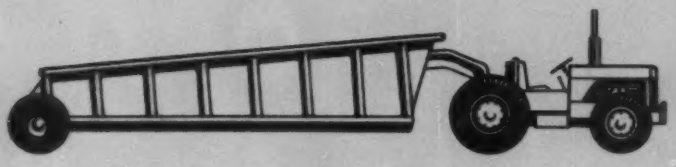
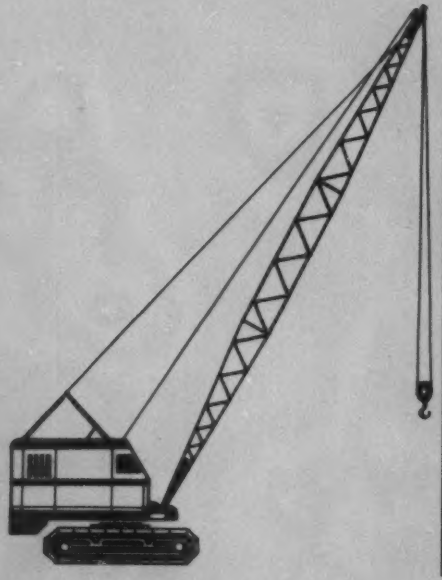


BOTTOM DUMP

Size	Autocar	Euclid	Kenworth	KW-Dart	Le Tourneau Westinghouse
16 Yds. (Struck)					C
17 Yds. (Struck)		28TDT-122W			
25 Yds. (Struck)		33LTD-132W			
35 Yds. (Struck)	AP-25T			70 BDW	
COAL HAULERS					
25 Tons		26FDT-121W			
40 Tons		33LDT-133W			
50 Tons	AP-25T			50S-BDT	
51 Tons		24TDT-129W		70S-BDT	
70 Tons			803-T		

TRACTOR-SCRAPERS

Size (cu. yds. heaped)	Clark	Euclid	I.H.	Le Tourneau Westinghouse	M-R-S	Wagner	Wooldridge	Westfall
5.7						IND-6		
9						IND-9		
10.5	110							
12						IND-14		100
13			2T55					
16		26DT-18SH						
18				C				175
19	210							
21			2T75				CW-215	
25		28TDT-36SH			125	IND-24		
26								Performer
27				B	150		CW-320	
29	310							
32		33LDT-32SH			190			
41.5					200			
48					250			

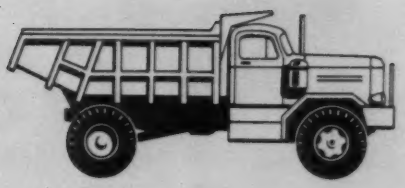


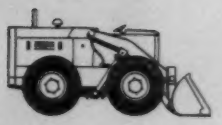
CRANES

Size (tons)	American Hoist	Baldwin Lima	Bay City	Dominion	Gar Wood	Insley	Le Tourneau Westinghouse	Link-Belt Speeder	Marion	Orton Crane	Thew
6										3E-UDT	
7.5										6E-UDT	
10										8E-UDT	
15										12E-UDT	
20		34, 25-T			75BT		C			16E-UDT	
21									35-M		
25		34-T, 34-TS, 44	600		100BT			HC-88	35-MTC	22E-UDT	
27									43-M		
30		44-T	720				B	HC-98	37-MTC		SP-530
32										26E-UDT	
35		54-T 604 703		480		WB		HC-108			MC-530 (Both MC-503 Carriers TSP-530W and Turntables)
40	595C	64							43-MTC	32E-UDT	
43									362		
45						WB					
50		64-T, 64-SC, 703-SC, 803								42E-UDT	
60				550							
70		1201, 84-T									
75									87-M		
80									93-M		
84									101-M		
85		1250									
100		1250-SC									
168									111-M		

REAR DUMP TRUCKS

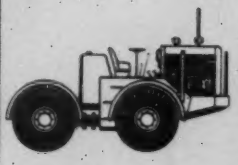
Size (tons)	Autocar	Euclid	I.H.	Kenworth	KW-Dart	Le Tourneau Westinghouse	Mack	Oshkosh	Wooldridge
10					10S				
15	AP-15	80FD			15SL		LRX		
18		94FD	PH65	801					
22		36TD 46TD				C		W-2500	
22½							LVX		
24			PH95	802					
25	AP-25				25S 25SL				CWD-214
27		66TD							
28								W-2800	
30					30SL		LRSW		
34							LRVSW		
35					35T 35SL	B			CWD-321
36				803					
40	AP-40	10FFD							
48				802-B					
50		4LLD			50T				
64				803-B					





TRACTORS

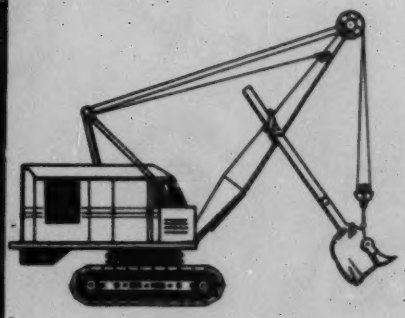
Size (H.P.)	Eimco	Le Tourneau Westinghouse	M-R-S	Wagner	Westfall
110				IND-6	
130				IND-9	100
160	105-T			IND-14	
175					175
210		C			
220			125	IND-18	Performer
262			150		Performer
300				IND-24	
310			190		
335			200		Performer
600			250		



TRACTOR SHOVELS

Size (yds.)	Clark	Eimco	Frank G. Hough (IH)	Mixermobile	Pettibone-Mulliken	Thew
1½		105 (Excavator)		LD5PD	125	
1¾						ML-153
1⅞				LD7D		
2¼			HOD		175	
2½				LD7AD		
2¾	175A	105				
3½				LD8AD	250	
4	275A					
4¾				LD12AD		
6	375A			LD15AD LD12AD		

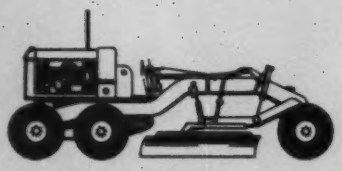
SHOVELS



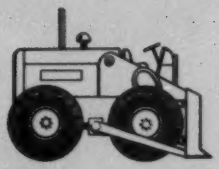
Size (yds.)	American Hoist	Baldwin Lima	Bay City	Bucyrus Erie	Dominion Engn. Wks.	Insley	Koehring	Link-Belt Speeder	Manitowoc	Marion Power	Ortan	Thew
⅛											3E-CDT	
¾	300	34						LS-88		35-M	6E-CDT	
1	500	44	60			WB		LS-98	1600	43-M	8E-CDT	
1¼		64							2000		12E-CDT	Lorain 56
1½	700	604	72	38-B	480			K-360		362	16E-CDT	
1¾		703						K-365 K-370 K-375			22E-CDT	
2		802		51-B			805		3000		26E-CDT	
2½		803			550					93-M	32E-CDT 42E-CDT	
2¾				54-B					3500			
3				71-B			1205	K-600 K-606-L	3800	101-M		
3½		1201										
4		1601		88-B					4500	111-M		
5									4500			
5½									4500			

GRADERS

SIZE (H.P.)	ADAMS	GALION	HUBER-WARCO
80	330		
100		104	
115	440		
123	550		
130		T-500 118	6-D2
135	550-T		
160	660	T-600 160	7-D2
190	660-T	T-700	



TRACTOR-DOZERS



Weight (lbs.)	Clark	Eimco	Le Tourneau Westinghouse	Wagner	Westfall
16,500					100
20,100				IND-14	
22,500					175
27,600				IND-18	
33,380	180				
34,600			C		
37,000		105 105-T			
40,000					Performer
51,300	280				
74,150	380				
104,000	480				

SPECIALIZED CONSTRUCTION AND MINING EQUIPMENT MANUFACTURERS WITH CUMMINS (STANDARD OR OPTIONAL) POWERED MODELS

AIR COMPRESSORS
Chicago Pneumatic Tool Co.
Joy Manufacturing Company
Worthington Corporation

BATCH PLANTS
Barber-Greene Company
Hetherington and Berner Inc.
Iowa Manufacturing Co.

BUCKET LOADERS
Barber-Greene Company
Pettibone-New York Div.

COMPACTORS
Buffalo—Springfield Roller Company

CRANE CARRIERS
Baldwin-Lima-Hamilton
Crane Carrier Canada Ltd.
Crane Carrier Corporation
Hendrickson Manufacturing Company
KW-Dart Truck Company
Sicard, Inc.
The Maxi Corporation

CRUSHING PLANTS
Bros Inc.
Diamond Iron Works
Eagle Crusher Company
Iowa Manufacturing Company
Lima Austin-Western
Universal Engineering Company

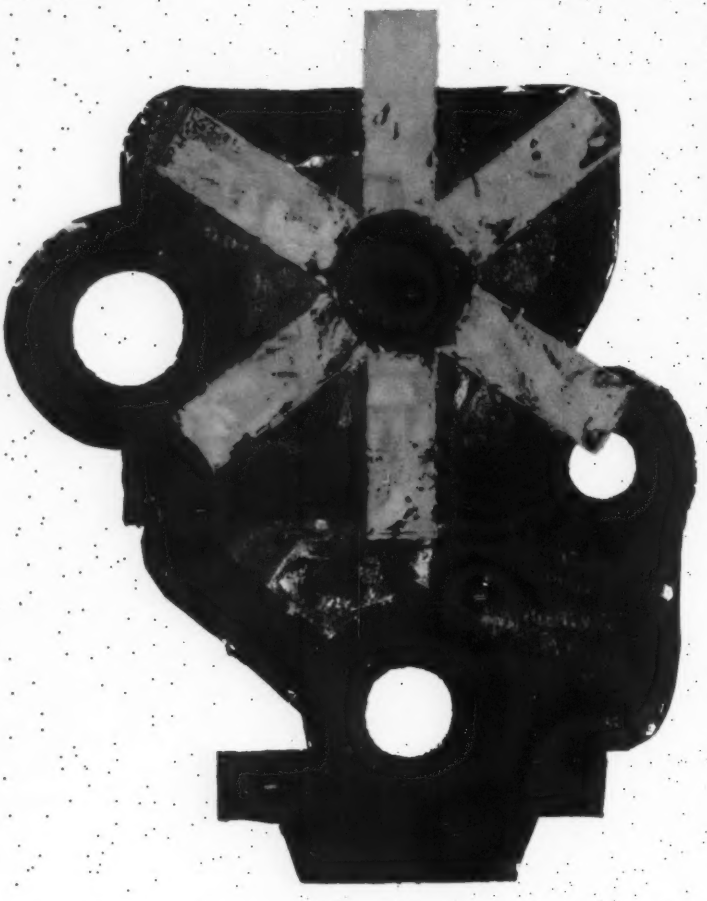
DITCHERS
Barber-Greene Company

DRILLS
Reich Brothers Manufacturing Co.

MIXERS
Barber-Greene Company
Bros Inc.
Iowa Manufacturing Co.
Pettibone-Wood Manufacturing Co.

PAVERS
Chain Belt Company (Rex)
Iowa Manufacturing Co.
Worthington Corporation

ON AND OFF-HIGHWAY DUMP TRUCKS IN 62 MODELS BY 10 MANUFACTURERS



REPOWER WITH CUMMINS

32 models for every application

HP	Model
100 h.p.	J-6
110 h.p.	JF-6
115 h.p.	HR-4
115 h.p.	HRC-4
130 h.p.	NHC-4
130 h.p.	JN-6
130 h.p.	NT-130
160 h.p.	JS-6
160 h.p.	H-6
165 h.p.	NT-4
175 h.p.	JNS-6
175 h.p.	HR-6
175 h.p.	JT-6
180 h.p.	NT-180
180 h.p.	NH-180
190 h.p.	HRF-6

HP	Model
195 h.p.	NH-195
200 h.p.	HS-6
200 h.p.	NT-200
220 h.p.	NH-220
240 h.p.	HRS-6
250 h.p.	NT-6
262 h.p.	NTO-6
265 h.p.	L-6
290 h.p.	NHS-6
300 h.p.	NRT-6
320 h.p.	NHRS-6
320 h.p.	LR-6
335 h.p.	NRTO-6
450 h.p.	NVH-12
450 h.p.	LRT-6
600 h.p.	VT-12

Only Cummins offers a diesel for every construction machine . . . with these features!

- **Cummins Engineered Repowering.** Job-site or shop conversions. Installations are made from factory approved repowering studies.
- **Cummins Long Engine Life.** Better heat dissipation afforded by 4-cycle design, coupled with Cummins sturdier construction of crankshaft and other components, means longer engine life for you.
- **Cummins Economy.** The highly efficient Cummins designed combustion chamber provides maximum fuel economy—saving as much as 50¢ per operating hour!
- **Cummins PT Fuel System.** With only 188 parts, as much as 275 fewer parts than competitive systems, you have simplicity and economy of maintenance.
- **Cummins Dirt-Proofing.** Air cleaners, caps, connections, oil system and all entrance points for destructive grit have been made dirt-proof by Cummins proven protective system.
- **Cummins Service.** Geared to your on-the-job service needs —just call your local Cummins Distributor and he'll be there —more than 300 service points throughout the U.S. and Canada.

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

EXPORT — CUMMINS DIESEL EXPORT CORPORATION — COLUMBUS, INDIANA, U. S. A. — CABLE: CUMDIEX
OVERSEAS FACTORY — CUMMINS ENGINE COMPANY LIMITED — SHOTTS, LANARKSHIRE, SCOTLAND — CABLE: CUMSCOT SHOTTS TELEX

Litho in U.S.A.

PLAN '59 FOR WHAT'S AHEAD

Equipment Prices Keep Going Up —But So Does Productivity

Everybody agrees that prices are rising and that equipment is improved. But to get a real idea of the relationship between prices and productivity, compare the machine you bought five years ago with the machine you can buy today.

Equipment costs 20 to 30% more today than five years ago. What caused this big jump?

Inflation is responsible for a big chunk of the price boost, but this still leaves a large percentage of the increase unaccounted for. Manufacturers are quick to point out that their profit percentages are not higher today than they were in 1953. The big reason for price boosts, they say, is that contractors demand increased productivity. They are getting better machines today, but they must pay for them.

For one thing, many of the optional features of 1953 machines are now standard equipment. Power-assisted controls were a novelty then, but they are standard now. The same goes for torque converters, in-seat starting systems, wider tracks or widebase tubeless tires, adjustable seats, and a host of other refinements.

And as engines get more powerful, they also get more expensive. To keep up with the contractor's request for more and more power, manufacturers must improve filtering systems, change drive-train components, enlarge fuel tanks, and beef-up frames. Newer alloy steels add strength and reduce weight, but they are expensive.

Does the increase in equipment productivity offset the increase in equipment prices? The figures prove that increased productivity pays off. Labor, equipment, and overhead costs for earthmoving contractors have risen more than 100% since the end of World War II. Yet the cost to move a yard of dirt is up only slightly.

How has equipment been improved in the past five years? To answer this question, CM&E compared 1953 and 1958 models of three basic earthmoving rigs—an 18-yd scraper, a 27-ton rear dump truck, and a large crawler tractor. In all cases the 1953 and the 1958 machines are new rigs made by the same manufacturer.

Ownership and operating costs for the 1958 machines are much higher, but so is productivity. New equipment increases the contractor's capacity, but he must keep his rigs working if they are to pay for themselves. As costs continue to climb, so does the penalty the contractor pays for downtime.

The real advantages of new equipment show up when 1953 and 1958 rigs are compared on a fleet basis. In many cases, increased productivity enables the contractor to do more work with fewer machines. This means that while the contractor's costs per machine are up, his costs per fleet are reduced.

Following are a manufacturer's cost estimates for 1953 and 1958 rear dump truck fleets working on similar jobs. Each fleet is required to haul 300 tph. The haul road is 1¼ mi long with some 4% adverse grades.

	1953	*1958*
Total cycle time, min	*13.27*	*13.55*
Trips per 50-min hr	*3.8*	*3.7*
Payload per trip, tons	*22*	*27*
Payload per hr, each	*84*	*100*
Number trucks required (to haul 300 tph)	*4*	*3*
Spare trucks	*1*	*1*
Cost per hr, each machine (owning and operating)	*$ 8.99*	*$ 9.47*
Total hourly cost	*$44.84*	*$37.88*
Cost per ton	***14.9¢***	***12.6¢***

The figures show that each 1958 truck hauls 100 tph, while each 1953 truck carries 84 tph. On this job, it took five 1953 trucks to maintain a 300 tph output, but only four 1958 trucks. Both fleets include one spare.

Capacity of the 1958 truck has increased by five tons. It takes longer to load the newer trucks, but they make up this time on the haul. The 1958 truck dumps its 27-ton load as quickly as the 1953 truck dumps its 22-ton load. Both trucks make about the same number of trips per hour.

Even when the 1953 dollar is adjusted to its 1958 value, the new truck costs about $4,500 more than the 1953 model. Estimated hourly ownership and operating costs are $.48 higher for each 1958 truck.

But although these costs are higher, the increased speed and capacity of the new units enables the con-

continued on page 124

Austin-Western 6-wheel grader gives Buffalo contractor 5 years' rugged service... maintenance cost only $300!

"We rely on Austin-Western for rugged, dependable performance. It's one tandem grader that has the guts and power to handle any tough assignment the construction business can throw at it." That's what George Sheperd, general manager of Bruner Asphalt and Construction, Inc., Buffalo, N.Y., has to say about Austin-Western graders.

No downtime

"We just don't have maintenance problems and expensive downtime with our Austin-Western equipment. Aside from routine service requirements, it is hardly ever in the shop. We receive excellent cooperation from the A-W distributor on the rare occasions when we do require parts or service.

"In construction, perhaps more than any other business, time means money. That's why the A-W's ability to tackle even the heaviest of jobs and do them faster is so important to us. Of course, the fact that we can always depend on the A-W to stay on the job and help maintain project schedules is equally important.

Powerful 6-wheel Austin-Western tandem grader prepares bedrock surface for construction of a cloverleaf, part of the giant New York thruway project. Rear wheels are offset to compensate for sidethrust of fully loaded blade.

"A man can do a better job when he likes his machine. A satisfied operator and a top-performance grader make an unbeatable combination. Our operator likes the A-W. He says it is comfortable to operate, and so easy to maneuver that even in reverse he can get right in between 12-ft. forms.

Four main reasons

"All-wheel drive . . . all-wheel steering . . . hydraulic controls . . . torque converter—I'd say those are the four main reasons why we're sold on Austin-Western. They combine to deliver power, traction, maneuverability and precision control!"

Investigate. Learn now why contractors the world over are choosing Austin-Western for the really tough construction jobs. The versatile, hard-working A-W is available in 6-wheel and 4-wheel models with a wide choice of power plants. Torque converter optional. Contact your nearby Austin-Western distributor or write us.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

PRICES, PRODUCTIVITY RISE...

continued from page 121

tractor to haul the required 300 tph with one less truck. For the same job, the contractor need invest less money in hauling units than he did in 1953, and his hourly operating costs are lower. His cost per truck is up, but his fleet costs have been reduced because fewer rigs can do more work.

Improvements in this 1958 truck range from a bigger body to a foam-rubber seat. The more obvious changes include an increase in horsepower from 300 to 335 and a boost in capacity from 22 to 27 tons.

Increasing capacity is not just a question of enlarging the body. To get the five-ton boost in capacity on this truck frame design and tire size were changed. The frame was strengthened at the point of maximum stress—directly behind the cab. From this point forward and backward the frame tapers down. This provides strength where it is needed, but reduces over-all weight.

The 16.00-25 front tires on the 1953 truck have been replaced with 18.00-25 tires. To make use of this extra front tire capacity, the cab was moved forward several inches and the body was lengthened and widened. This moves the center of gravity of the payload forward and allows body capacity to be boosted without overloading the rear axle.

Changes that reduce downtime or make preventative maintenance easier are numerous. The most important modification is that the transmission, steering, and hydraulic systems are now out in the open where mechanics can get at them.

Radiator tanks on the 1958 trucks are fabricated instead of cast. A cast tank can crack; a fabricated tank bends. All electrical wiring now is carried in metal conduit to prevent deterioration from grease or oil.

Other important changes also contribute to ease of maintenance. To isolate shock and vibration, the engine flywheel housing is now rubber-mounted. Headlamps are shielded against stones.

The third type of major improvement in the last five years is the addition of features that enable an operator to do his job better and faster. The 1953 truck had a three-speed transmission with a torque converter and an auxiliary brake (if one was specified). The 1958 truck has a four-speed transmission with an improved torque converter, auxiliary brake, and transmission mounted as a package.

Other improvements that aid the operator include a foam rubber, adjustable seat; a redesigned instrument panel that is set at a greater angle to improve instrument lighting and visibility; and an automatic converter lock-up in 2nd, 3rd, and 4th gears.

It is more difficult to evaluate the increased productivity of a crawler tractor, but there is no doubt but that the 1958 machine is more powerful, versatile, and dependable than its 1953 predecessor.

For the crawler tractors that CM&E compared, the price boost between 1953 and 1958 models amounts to more than $10,000—a 33% increase. But maximum drawbar pull also is increased by 33%—from 29,200 lb to 39,150 lb. Flywheel horsepower is up to 191 from 185 at 1,200 rpm.

The 1958 tractor is also easier to maintain. Unit construction of important components allows them to be dropped easily for servicing.

The bevel gear and pinion are pressure lubricated. Oil also lubricates steering and flywheel clutches, a design change that has cut clutch wear drastically. Tracks are adjusted hydraulically, and the recommended lubrication interval for rollers is 500 hr.

If the owner doesn't appreciate changes in the crawler tractor, the operator does. His visibility has been improved by narrowing the hood and raising the seat. The fuel tank is larger, but it is contoured to give the operator a better look at rear-mounted equipment. Gas or electric starting from the operator's seat is now standard, and steering clutches and brakes are hydraulically boosted. Most important of all from the operator's view, the torque converter is now available.

Delivery price of the 1958 scraper that CM&E compared with its 1953 predecessor is up 33%. The contractor's hourly ownership and operating costs are 26% higher in 1958.

But the 1958 scraper is 17% more powerful (218 hp vs. 186 hp); 10% faster (33.5 mph vs. 30.2 mph); and it carries 12½% more dirt (18 yd vs. 16 yd heaped). Even the cutting blade is 12% wider (9½ ft vs. 8½ ft). Tire are larger and tubeless, but they cost about $1,000 more per scraper.

The bowl on the 1958 scraper is lower and wider. This increases capacity and stability without a big boost in size and weight. Even though capacity has been increased by 2 yd, load, travel, and spread times have been reduced.

Following is the manufacturer's cost estimate for a single 1958 scraper when compared with a 1953 model. Both scrapers are working in common earth weighing 3,000 lb per yd. The haul road is 2,000 ft long with approximately 100 lb per ton of rolling resistance. Grades are 600 ft of 4% adverse, 600 ft of 4% favorable, and 800 ft level.

	1953	*1958*
Total cycle time, min	*6.87*	*6.12*
Trips per 50-min hr	*7.28*	*8.17*
Payload per trip, yd	*11*	*13.5*
Payload per hr, yd	*80*	*110*
*Machine cost per hr** *(owning and operating)*	*$9.85*	*$13.41*
Cost per yd	***12.3¢***	***12.2¢***

**Includes fuel, maintenance, tires, operator, depreciation, interest, insurance, taxes, blade and cable replacement, lubrication. Does not include pusher costs, overhead, supervision, or profit margin.*

These estimates point to a fact that holds true for just about every type of earthmoving rig. For this scraper, the initial cost is 33% higher, and ownership and operating expenses are up 26%. But hourly production has increased by 37%, and the cost to move a yard of dirt is actually lower now than it was five years ago.

Learn the most economical time to replace equipment . . . page 130

PROVED AND PREFERRED...

Timken-Detroit® Axles are the Accepted Standard!

Timken-Detroit Heavy-Duty Tandems Are First Choice With Big Off-Highway Operators!

These superior features make the difference:

"Cradle Ride" Suspension. Free ends of long, resilient springs float in axle spring guide brackets. This permits axles to articulate freely, compensating for road irregularities. Floating springs cradle the vehicle, materially reducing road shock and eliminating source of vehicle flutter. *The load is more stable . . . driving is easier, more restful, safer.*

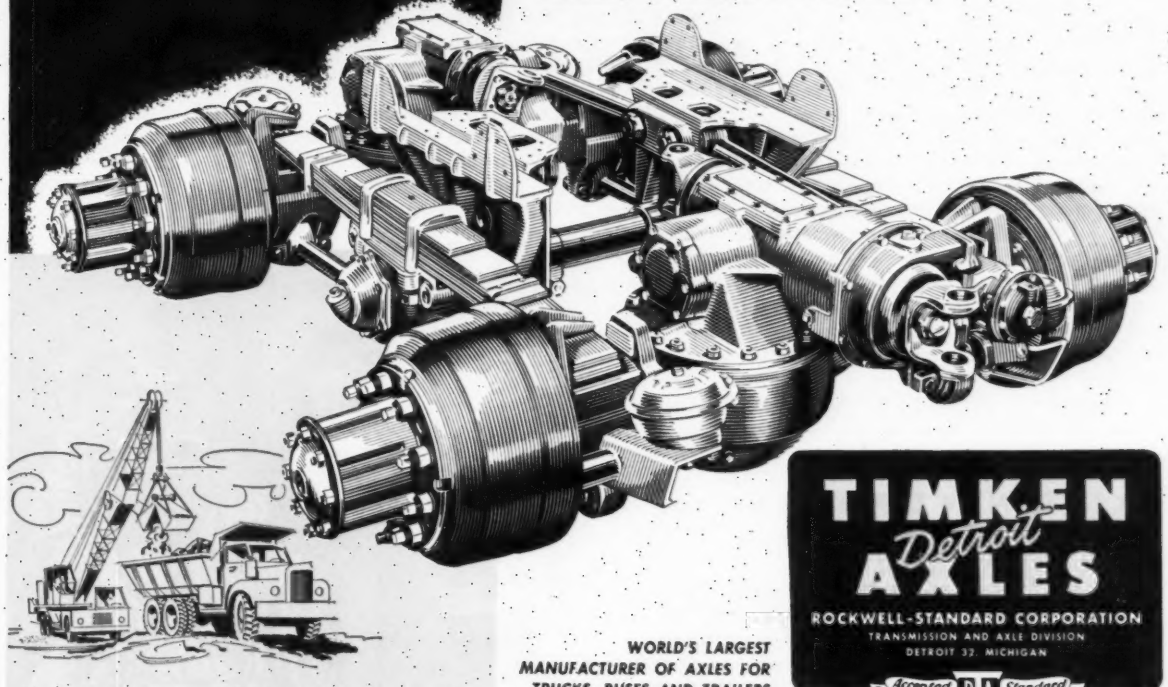
Hypoid Gears. Larger pinions and greater tooth contact give 30% more torque capacity, top efficiency and long life . . . *plus lower maintenance costs.*

Driver Controlled Inter-Axle Differential. Torque is divided equally between axles, yet wheels of one axle can turn faster or slower than wheels of other axle. This means both axles are always doing equal amounts of work. *Driving parts and tires last longer.*

Hot Forged Rectangular-Shaped Axle Housings. Rectangular shape, combined with full strength corner sections, provides the greatest strength with minimum weight and size. Welded-on bowl cover prevents leakage.

Torsion Flow Axle Shafts. More splines, plus greater root and body diameter, add extra strength.

Straight-Line Through Drive. Straight through drive eliminates all prop shaft angularity. Bearing and gear life is materially increased. Maintenance costs are reduced.



WORLD'S LARGEST MANUFACTURER OF AXLES FOR TRUCKS, BUSES AND TRAILERS

TIMKEN Detroit AXLES
ROCKWELL-STANDARD CORPORATION
TRANSMISSION AND AXLE DIVISION
DETROIT 32, MICHIGAN
The Accepted Standard

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From Liberty Mutual: a forward-looking concept of workmen's compensation coverage which provides

Protection in

—the real key to lower insurance

The real cost of your compensation protection is not the first price, but the final cost

Any insurance company or agent can quote you a price on business insurance for your people and your assets. Yet the ultimate cost of your coverage is, in a very real sense, determined by you. If you have an unfortunate number of accidents and suffer large losses over a period of time, you are actually contributing to a higher insurance rate for yourself. Anything you can do *now* to cut down on accidents and losses will help toward cutting your premium costs *in the future*.

This is why Liberty Mutual – the company with the largest experience in workmen's compensation service – has developed over the years a forward-looking concept of business insurance which gives you protection in depth. From the start of your Liberty coverage, a wide range of skills and resources can be put to work to help you anticipate and avoid accidents and loss, lessen their impact if they happen and keep future costs down.

In today's business climate, *PROTECTION IN DEPTH* can be more important to you than ever

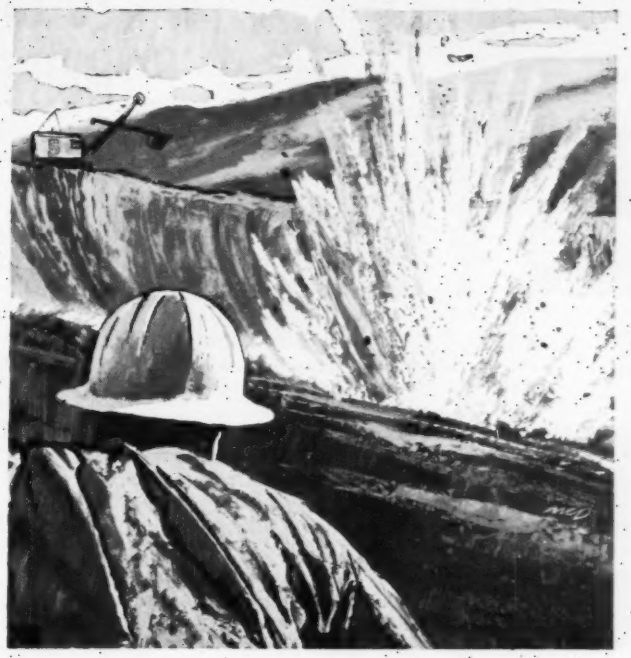
Today every contractor – whether he employs 5 people or 500 – must take a new and careful look at expenses. The protection in depth you get from Liberty can help you trim excess dollars from your insurance costs without sacrificing any of the coverage you need to safeguard your business.

This kind of protection has enabled Liberty Mutual to set an impressive cost-cutting record. In turn, this has meant steady growth in business written and a large share of "blue-chip" accounts. Because we deal directly, our salesmen have at hand the experience of the entire company to draw on, and they are expected to have the skill to see that it is applied to the problems of any policyholder, large or small. This direct-dealing, mutual form of operation not only helps policyholders control loss, but is also one reason why over the years Liberty has been able to return more than $455 million in dividends to policyholders.

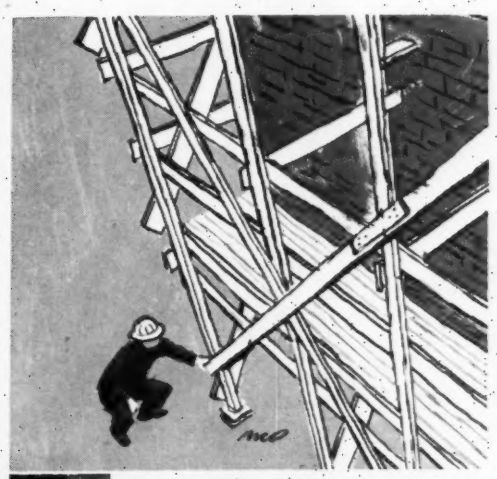
We believe that protection in depth can today lead to significant improvement in your insurance cost picture. We invite you to become acquainted with protection in depth now.

depth

costs today



Power under control. To protect buildings from damage from blasting, Liberty engineers developed an instrument which measures ground vibrations, tells exactly how much dynamite can safely be used in a specific locale. Result: fewer accidents, safer working conditions.



Finding trouble before it happens. A Liberty construction engineer checks the scaffolding on a job to make sure it's strong – and safe. Result for policyholders: fewer lost-time accidents, lower insurance costs in the future.

Test for tiredness. At Liberty's research center, a "worker" goes through his paces so that our scientists can learn to measure human effort and fatigue. Goal: new knowledge of when worker efficiency begins to fall off, cause accidents.

Behind *PROTECTION IN DEPTH* is the broad range of Liberty's special skills and resources

The services available to Liberty Mutual policyholders are often broader in scope than most other companies or agencies can offer. Many are routine and offered as a standard part of Liberty's work. A few are Liberty exclusives. All are ready for "trouble shooting" – to crack dangerous or money-wasting problems that any policyholder may have. Some of these include:

A full-time staff of construction engineers to study jobs before work begins, provide safety recommendations and help solve problems in such fields as materials handling, falsework design, soil testing and structural safety.

Two rehabilitation centers to rebuild the self-respect of seriously injured workers and to speed their return to work.

These Liberty "extras," and the others shown on this page, all work to give you the best possible protection in depth. They are all available to any policyholder – large or small – who needs them. All of them can work with you to lower insurance costs.

Look for more from

LIBERTY MUTUAL

...the company that stands by you

LIBERTY MUTUAL INSURANCE COMPANY • LIBERTY MUTUAL FIRE INSURANCE COMPANY • Home Office: Boston Insurance for: Automobiles, Liability, Group Accident and Health, Fire, Workmen's Compensation, Marine, Crime

Nello Teer Sr., Chairman of the Board and founder of the Nello L. Teer Co. Mr. Teer has been a regular reader of CONSTRUCTION METHODS magazine since 1919.

To rack up $100 million of Nello L. Teer Co. combines men — and millions of

THE CONTINUOUS RISE of construction contract awards and the corresponding increase in construction machinery sales point to record volumes of construction in the months and years ahead. As completed construction reaches an estimated new high of $49* billion in 1958, the role of contractors like the **Nello L. Teer Company** becomes increasingly greater.

Since its beginning in 1909, the Nello L. Teer Company of Durham, North Carolina has contributed a significant share of completed construction to the nation's economy. Today, it stands as one of the nation's foremost contracting firms. The company was founded by Nello L. Teer Sr., Chairman of the Board. He began with three men, six mules, a few drag pans and wagons, and expanded to 410 head of mules and larger wagons. Today, the company operates millions of dollars of construction machinery of every description, has a permanent staff of 275, and some 1,600 workers.

From local contracts in and around its headquarters in Durham, Teer expanded its operations throughout North Carolina, Pennsylvania, Maryland, Tennessee, W. Virginia, and as far as Central America and Africa. Teer engages in engineering and contracting for streets, highways, airports, railroads, dams, tunnels, bridges, etc. Most of the work arises out of the performance of public contracts for foreign, federal, state and local governmental agencies. Considerable work is done under private contract.

Over 12,000 miles of highways built by Teer

The heavy and highway division of the company is equipped to handle the construction of streets, highways, railroads, airfields, dams, bridges, canals and other structures. Large fleets of earthmoving and rockmoving equipment are used in most of the Eastern States, Africa, Iceland, Central America and Cuba. In the company's 50-year history, it has built over 12,000 miles of highways.

*U. S. Dept. of Commerce

Owns and operates 6 crushing and 3 asphalt plants

The Teer company owns and operates its own asphalt plants and quarries. Some are permanent installations and many are constructed for relocation from one job to another. The six aggregate producing plants turn out an average of 17,000 tons per day. Each of the asphalt plants is capable of turning out an excess of 150 tons per hour. The largest percentage of aggregate and asphalt is used in Nello L. Teer projects.

2,500 units of construction machinery operated by TEER

To produce $100 million of construction in 5 years — ($26,000,000 in 1957) — requires the use of tremendous amounts of equipment, materials, and manpower. Large numbers of almost every type of heavy and light construction equipment is used in the variety of Teer's construction operations. The following is a breakdown of the major equipment employed by Teer:

crawler tractors—(Caterpillar, International)
scrapers—15 yd. to largest (Caterpillar, Euclid)
graders—(Caterpillar)
cranes—(Northwest, Marion, Link Belt, Lima, Insley)
truck cranes—(Lima, Northwest, Marion)
front-end-loaders—(Hough, Michigan, Pettibone-Mulliken, Caterpillar)
compressors—(Schramm, Gardner-Denver, Ingersoll-Rand)
pavers—(Barber-Green, Rex)
pumps—(Fairbanks-Morse, Johnson, Jaeger, Rex)
rollers—(Galion, Buffalo-Springfield)
vibrators—(Jackson)
trailers—(Rogers, Talbert)
Gradalls
shovels—(Marion, Michigan, Northwest)
rotary drills—(Mayhew)
spreaders—(Blaw-Knox)
concrete mixers—(Rex)
tampers (Gardner-Denver)
tractors — wheel-type — (International)
pickup trucks—(Ford, International, Chevrolet)
dump trucks—all sizes—(Ford, International, Euclid)
generators—all sizes—1½ kw to 350 kw
fuel trucks — (International, Fords)
finishing machines—(Heltzel-Flex-Plane)
77 radios—(Motorola)
15 master radio stations
60 cars—(all makes)
3 asphalt plants
6 crushing plants
1 twin-engine DeHavilland Dove Airplane

$4.4 million highway construction project along Ohio river at Aliquippa, Penna. Total length of project was 2½ miles. Project required 3,000,000 cu. yds. of rock excavation. Marion 111-M shovel shown loading Euclid dump truck.

$3.2 million highway project on U.S. 15, Dillsburg, Pa. Contract was six miles long, requiring 900,000 yds. of grading and 150,000 sq. yds. of concrete paving.

construction in 5 years . . . contractor over 2,500 units of machinery — 1600 dollars of materials

Of the 2,500 units of equipment which Nello L. Teer Company employs . . . **over 150 pieces are Caterpillar equipment of all sizes; over 60 Euclid units; over 25 International Harvester; over 12 Northwest; over 10 Marions; over 5 Lima; over 5 Koehring; over 200 trucks,** (Fords, International dumps, flats, trailer dumps, etc.). This gives you some idea of the magnitude of the Nello L. Teer construction operations, and the vast amounts of construction equipment (both heavy and light) that is required in order to carry out its contracts.

$9 million spent for materials, gas and oil in 1957

To keep 2,500 units of equipment operating efficiently, the Teer company invests some $3 million for gasoline and oil per year. Large expenditures are required for necessary construction materials including $3 million for steel . . . $600,000 for asphalt . . . $100,000 for lumber and $1¼ million for cement. Here is evidence of the tremendous purchasing power of contractors for equipment and materials required to complete millions of dollars of contracts per year.

Many influence purchases in Teer Company

The purchase of equipment in the Nello L. Teer Company ranks among the most important of all contractor operations. It is not a one man job! Rather, all equipment buying is discussed between the officers of the company, the superintendents who are asked for their recommendations and the master mechanic who is consulted. "Buying in our company is the result of a combined decision of the key men in the organization," says Nello L. Teer Sr.

The tremendous pace and progress of the Nello L. Teer Company has been stimulated by the younger men of the organization who are trained in the constantly improving modern construction methods and machinery. In addition to Nello L. Teer Sr., the men responsible for the management and direction of the company are Nello Teer Jr., President; Dillard Teer, Vice President; Hubert Teer, Secretary-Treasurer; Homer L. Riley, Vice President; Charles Waller, Vice President; James T. Love, Vice President.

"CONSTRUCTION METHODS Magazine has been helpful to me since 1919," says Nello L. Teer Sr., founder and Chairman of the Board of Nello L. Teer Co.

"CONSTRUCTION METHODS is a very good publication. It provides us with construction information which we are all looking for. I personally go through it and pass it on to our engineering department. I have learned many construction techniques many times from CONSTRUCTION METHODS. It is not only read by me, but used by our engineering department who look to it for ideas to improve our operations. We read the ads very carefully looking for different items. We have written to its advertisers asking for information on the equipment advertised. We find the advertisers in CONSTRUCTION METHODS fine people to do business with." Thus spoke Nello L. Teer Sr.

Speaking of CONSTRUCTION METHODS, Nello L. Teer Jr., president, says:

"Every officer in this company regularly reads CONSTRUCTION METHODS inasmuch as it offers an opportunity to see how problems are met and handled by other contractors. It also affords us an opportunity to secure advanced information on new machinery and supplies, that would be useful to us in the bidding and construction of our projects."

In all, there are 19 key personnel in the Teer company who are paid subscribers to CONSTRUCTION METHODS AND EQUIPMENT. It is paid for and read by over 46,000 key men in construction . . . 64% of whom are in some 13,250 contracting firms.

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Construction Methods AND EQUIPMENT

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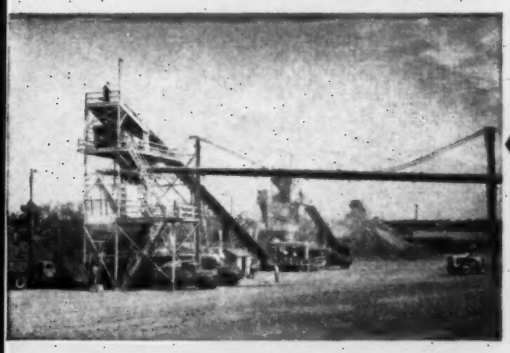

At left is one of Teer's seven aggregate producing plants which turn out an average of 17,000 tons per day. At right is equipment at work in the Teer Quarry at Durham, North Carolina.

PLAN '59 FOR WHAT'S AHEAD

Take Some of the Guesswork out of

Obviously the most economical time to replace equipment varies from machine to machine and contractor to contractor. But here are three guides that can be used to make this determination more than a seat-of-the-pants procedure.

One of the most difficult questions a contractor has to answer is, "When should I replace my equipment —what is the most economical time to trade or sell some of my existing fleet units and buy new machines?"

Reason for the difficulty is that there are no hard and fast rules or formulas that will give a definite "replace" or "don't replace" answer. Yet this phase of construction management is vital. Trying to operate with outmoded or less productive equipment can be a terrific competitive disadvantage. But buying too much machinery too soon is money down the drain. As one highly successful construction man puts it: "A contractor's iron can eat up the world. But if he's not careful, it can eat him up too."

A Contractor's Method

To help keep him from being eaten, our contractor friend has devised a guide to determine (1) when and (2) what to replace or acquire in the way of construction machinery. The system is based on an assignment of point values to the basic phases of the problem, then summing the points to arrive at a conclusion. Point value assignments range from 1 to 10 according to the severity of the situation. A value of 10 indicates a "must" or absolute situation. Here's how it works:

1. Determining When to Replace

The contractor's individual situations that create a need are the only cause for replacing old equipment with new. These situations, and their suggested point values are:

a. Work volume **5 to 10**
b. Requirements of specifications **10**
c. Desire to up-grade fleet **1 to 5**
d. Mechanical failure, poor performance, preference of field forces for another make rig, etc. **1 to 5**

Any sum of 18 or more point values would indicate a "do it now" situation.

2. Determining What to Replace

To analyze which of several pieces in present inventory should be disposed of to meet the demands determined by the previous analysis, assign point values as follows:

a. Age **5 to 10**
b. Obsolescence **1 to 5**
c. Present mechanical conditions **5 to 10**
d. Trade-off allowance or cash value **1 to 10**

Any sum of 20 or more would indicate that this is the machine to "dump."

3. How it Works

Say, for example, that the contractor takes on new work that requires loading of borrow. Specifications and pit location indicate the need of a 2½-yd shovel. Present inventory contains two old shovels, which are available. Now let's see whether or not he should replace the old at this time:

1a. Work volume, with two machines available, does not indicate replacement. Assign lowest point value.	5
b. Specifications require blending of material at face. A must situation.	10
c. Desire to up-grade inventory of 2½-yd shovels in face of low volume of work is not too urgent.	2
d. Available shovels have given good performance.	1
Total	**18**

The total of 18 indicates a somewhat marginal situation. Therefore, let's go further to see whether or not to use one of the available shovels:

	4-yr-old Shovel	8-yr-old Shovel
2a. Age	7	10
b. Obsolescence—No great improvements.	2	3
c. Present mechanical conditions—4-yr-old machine just in from previous work and not overhauled — 8-yr-old machine has had lots of work hours but is ready for more.	10	5
d. Value—Newer machine, despite poorer mechanical condition, will bring $5,000 more trade allowance than older rig.	8	4
Total	**27**	**22**

The conclusion would seem to be that for best

Equipment Replacement Policy

value the 4-yr-old machine, in its present condition, should be traded against a new machine. Because of its comparatively young age, it has considerable book value remaining. The 8-yr-old shovel could be placed on the work immediately while negotiations for purchase of the new machine are proceeding and while awaiting delivery. However, as soon as the new shovel arrives on the job, negotiations for disposal of the old should be instituted. That's both because of its age (no book value) and because in its present good mechanical condition it will bring the best price.

Obviously, assignment of correct point values depends on thorough consideration and judgment of each situation. And it is this matter of judgment that prompted another contractor to say, "You can make a real art of equipment purchasing, selling, and trading."

A Manufacturer's Method

Actually, with the varied nature of the contracting business and the different conditions under which machines are operated, replacement procedures must be mostly art instead of science. But to help with this, Caterpillar Tractor Co. has developed its METRE (Most Economical Time to Replace Equipment) method to aid the owner in detecting the point of lowest operating cost. Accuracy depends on the specific data the equipment owner can supply from records or performance estimates.

One factor, of course, is major repair and overhaul costs. Others are productivity, availability, and capital decline costs.

Productivity is probably the most difficult to measure. But Caterpillar recommends that, when using an older machine, it should be charged for its inability to produce as much as a new one. Thus they feel it fair and conservative to charge what, in effect, is rental of another rig to make up lost production.

Non-availability, downtime for reasons other than for major overhaul compared to possible working hours, can also be charged on a similar rental basis, Cat says. Naturally, the older the machine the more time will be required for adjustment and repair.

Capital decline is the difference between original cost and trade-in value. And this should be charged to the machine in the year the decline occurs, not averaged over the life of the rig.

These four costs, on an hourly basis, are summed up for each year. Then the hourly costs of the first two years are averaged to find the per-hour cost if traded at the end of two years. The process is repeated, averaging three-year costs and so on, until the lowest hourly cost is found. This is the number of years the machine can be operated economically.

To illustrate its METRE method, Cat cites the following hypothetical example of an average-sized tractor costing about $20,000. The assumption is that it would work 1,800 hours each of the first three years, 1,500 hours yearly thereafter. Hourly repair and overhaul costs are CM&E estimates. In this example the lowest rate per hour occurred at the end of the third year.

	Year					
	1	2	3	4	5	6
Yearly Operating Hr.	1,800	1,800	1,800	1,500	1,500	1,500
Cumulative Hr.	1,800	3,600	5,400	6,900	8,400	9,900
	Cost Per Hour					
Repair & Overhaul*	.80	1.95	2.60	3.10	2.95	3.55
Productivity	0	.20	.40	.60	.80	1.00
Unavailability	.40	.50	.70	1.10	1.40	1.70
Capital Decline	4.22	1.55	.89	.80	.27	.27
Total Hourly Cost**	5.42	4.20	4.59	5.60	5.42	6.52
Average Hourly Cost if Tractor Is Replaced at End of Given Yr.	5.42	4.81	4.74	4.95	5.05	5.29

*CM&E estimate **Excludes operator, fuel, grease, etc.

A Professor's Method

R. L. Puerifoy, professor of construction engineering at Texas A & M College, takes a different approach for determining the economic life of equipment. In an article in McGraw-Hill's "Construcción," he suggests the following method:

Figure net salvage value at the end of each year and subtract from original cost to obtain total depreciation. Figure cumulative cost of depreciation and repair. From this, compute average hourly cost.

However, because of reduced efficiency with age, the available unit output as a percent of a new machine's productivity must be introduced. With these factors and the hours worked yearly, figure cumulative output. Dividing this into average hourly cost will give cost per unit of production. When this cost starts to rise, dispose of the machine.

Professor Puerifoy cites the following hypothetical case of a $30,000 tractor whose average hourly cost would indicate a 12,000-hour economic life, yet whose unit cost of production shows it should be used only 10,000 hours.

continued on next page

Hours Used	2,000	4,000	6,000	8,000	10,000	12,000	14,000
Net Salvage Value	18,000	10,800	6,480	4,100	3,000	2,200	1,600
Total Depreciation	12,000	19,200	23,520	25,900	27,000	27,800	28,400
Cumulative Dep. & Repair	13,560	23,520	31,773	39,875	47,150	56,740	68,000
Average Hourly Cost	6.78	5.88	5.29	4.98	4.72	4.72	4.86
Output Units, per Hr	100	98	96	93	89	84	75
Cumulative Output Units (thousands)	200	396	588	774	952	1,120	1,270
Cost per Unit of Production	.0678	.0593	.0540	.0515	.0496	.0507	.0536

EQUIPMENT REPLACEMENT POLICY . . . continued

The foregoing approaches to the problem of determining the best time to replace old machines with new must, of course, be heavily tempered with judgment. And there are other important factors, such as the contractor's financial and tax situation, that must be weighed.

Whether or not you follow a formal replacement program, it is important to keep complete and correct records. Unless you know ownership and operating costs, including costs for maintenance and repair, and keep track of unit production, trying to analyze machine performance is futile.

One money-making grading contractor concentrates on the machine's downtime. "We use a 50-minute working hour as a gage, and expect to get it. First we compare the machines in a spread, assuming they are competive, and weed out the lemons. Beyond that, if any one machine can't keep up with others in its spread, we yank it out so it won't louse up the production cycle. It's already obsolete for that type work in our outfit."

Another roadbuilder runs each of his units until, as he says, "it's obsolete productionwise." He's constantly comparing his newer machines with his older units. He has his dealers arrange for equipment demonstrations and time studies. And he keeps close check on what's going on in the industry.

"We keep careful records," he explains. "We know our costs and bid accordingly. We lose our share of jobs, too. But if we're consistently underbid, we check the successful bidders' jobs to see how they do it."

And he often winds up buying new machines to regain his competitive position.

Few will disagree that there are places for machines of many different ages on most heavy construction jobs. And units that have outlived their time in the production cycle can still be useful on auxiliary work—tractors pulling rollers, or handling shovel clean-up, or acting as drill jumbos, for example.

But don't depend on outmoded rigs to handle the items where the money lies. "Replace machines in 4 to 5 years at the most," says one medium-sized contractor, "or else you're really starting to gamble. You'll no longer be really competitive. And there's only a limited possibility of growth when operating old equipment.

"Older machines are operated on hope. The guy who uses them is betting he can keep the stuff together through the life of the job. It's true that such companies are usually almost one-man outfits. But still their greatest desire is to have a new spread."

Can Contractors Live With Today's Depreciation Rate? on p. 134

ROCKFORD
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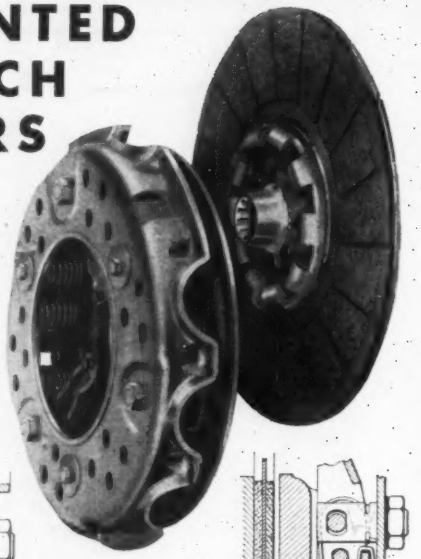

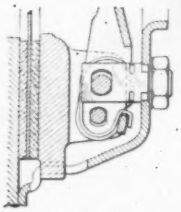

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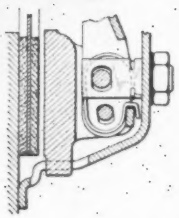
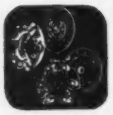
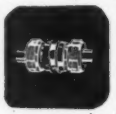


Patented rolling fulcrum pin action, in the release lever, results in much less friction and wear, and smoother release operation in this clutch than in some other types of clutches. Pin automatically returns to original position. Carefully balanced levers avoid lever throw-out at high speeds.


Small Spring Loaded

Heavy Duty Spring Loaded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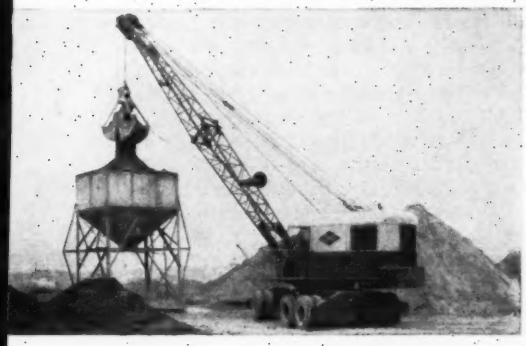

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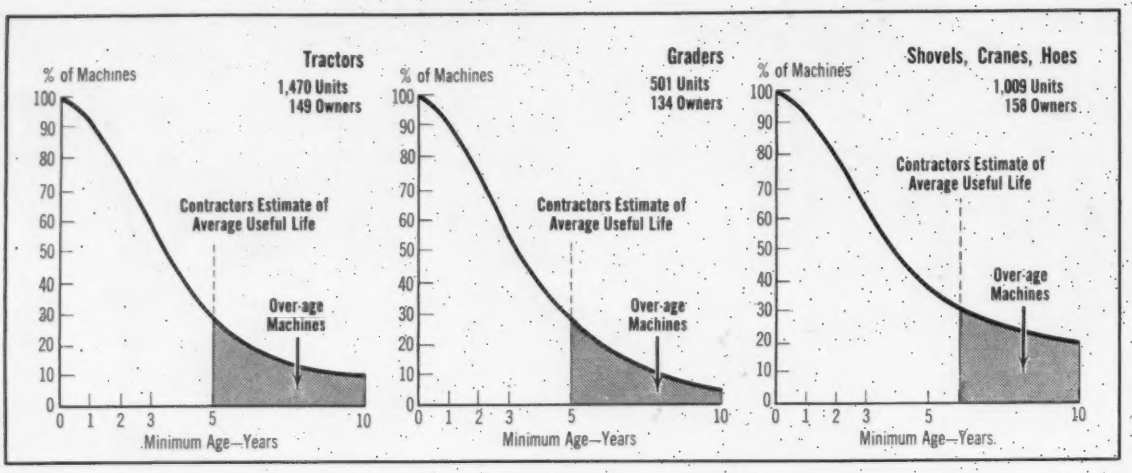
PLAN '59 FOR WHAT'S AHEAD



Are Depreciation Rates Realistic?

They're not, according to 70% of the contractors surveyed by CM&E. Only 54% said their depreciation reserves are adequate to cover original equipment cost. And for nearly 90%, reserves are inadequate to cover replacement.

"Salvage allotment is eating up our capital like cancer, and growing every year."

"Use 50% of the equipment life shown in [Internal Revenue Service] Bulletin F if you wish to avoid bankruptcy three years from now."

"Present methods are not sufficient to recapture capital outlay, and require additional capital for purchases."

"At present we are using machines far beyond their useful life because of current depreciation policies of the IRS, particularly the lives of equipment as shown in Bulletin F."

These sample comments are part of the results of a CM&E survey of contractors' equipment depreciation practices. And the survey indicates that sentiments such as the above are shared by much of the contracting industry. It reveals that current depreciation rules are hurting financially. And it shows that contractors are still operating many machines that are overage by their own estimates (*table, right*).

It looks as though the situation is worsening, too. Companies are not recovering even original equipment costs fast enough, much less replacement costs. Accumulated depreciation reserves, plus resale value or realistic salvage value, are less than the original investment, according to 46% of all replies.

More of the smaller outfits are in trouble: 62% of those doing less than $500,000 annually have insufficient reserves, as against 50% of the $1 to $2-million class and only 20% of the over $5-million outfits (Table, page 136). Reserves are a median 20% too low, however, regardless of company size.

As you would expect, the picture is even bleaker when depreciation reserves are compared to equipment replacement costs. Here, 89% of reporting firms have inadequate funds. And contractors of all sizes estimated the deficiency at a median 26%.

But things would be even worse, it seems, without the faster equipment depreciation write-offs permitted since 1954. All but 20% of the respondent companies use the accelerated depreciation methods of double-declining-balance or the sum-of-the-years'-digits methods for at least some of their machines.

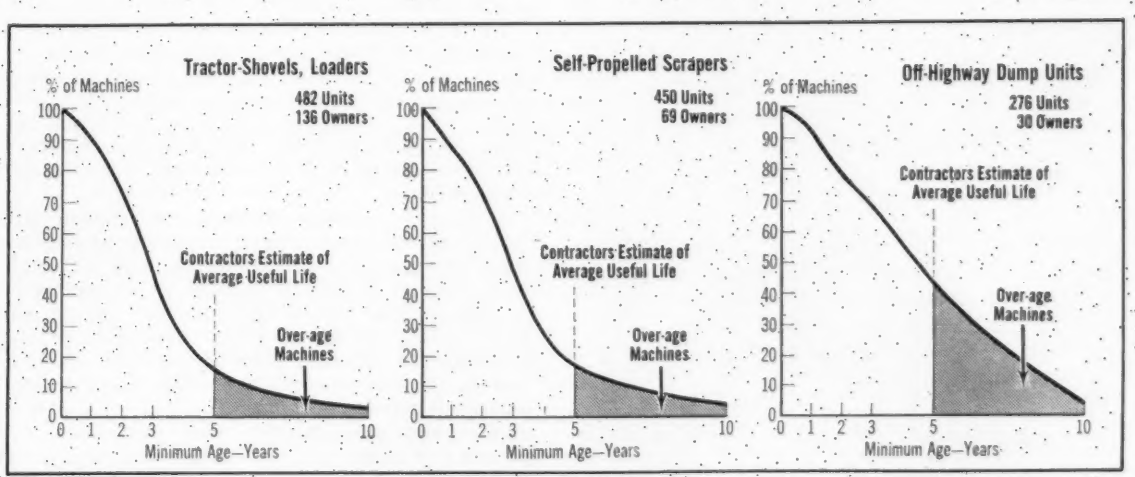
Fast write-offs improved the working capital position of 61% of these firms, aided buying of new machinery for 46%, and increased the profits of 30%. Many of these companies, of course, were helped in more than one of those categories.

Fast write-offs are an improvement, but still not enough help for average contractors, as we shall see later from their remarks. But what about Bulletin F's table of useful lives of machinery? One-word comments from those who thought the lives listed were too long—and 70% did think so—ranged from the haunting "optimistic" to the sharp "ridiculous."

continued on page 136

Equipment	Total Number	Average Per Owner	Percent of Machines In Various Age Groups						Useful Life	
			1 year or less	1-2	2-3	3-5	5-10	over 10	Contr. Est.	Bul. F
Air Compressors	804	5.5	10	12	17	25	23	13	5	5-8
Motor Graders	501	3.8	9	15	21	27	24	4	5	8
Trenchers, Ditchers	169	3.6	3	11	15	20	34	17	5	5
Cranes, Shovels, Hoes	1,009	6.4	7	13	17	26	27	10	5-7	5-12
Tractor-Shovels, Loaders	482	3.6	11	17	25	31	13	3	5	5
Tractors:	1,470	9.8	8	15	17	31	19	10	4-6	8-10
Self-Propelled Scrapers	450	6.5	13	15	24	31	13	4	5	6
Off-Highway Rear or Bottom Dump Units (including prime mover)	276	9.2	8	14	10	25	39	4	5	8
Trucks:										
Off-Highway Dump	504	8.7	13	16	21	25	10	15	4	8
Pick-up	1,752	11.0	12	24	25	27	10	2	4	5
Regular — all type	2,284	16.6	8	16	18	28	24	6	4	8
Automobile — company owned	886	5.3	25	35	23	14	3	—	3	2-5
Truck Mixers & Agitators	229	6.4	13	20	24	23	16	4	5	5
Concrete Batch or Mix Plant	138	2.6	6	11	20	27	24	12	7	10
Pavers — concrete	78	2.3	5	14	10	30	19	22	5	8
Concrete Spreaders & Finishers	136	3.9	9	18	26	35	7	5	4	4
Portable Crush-Screen plant	76	2.8	9	18	20	24	25	4	6	8
Asphalt Mix Plant	55	2.0	7	16	16	13	31	17	6	10
Pavers — asphalt	76	2.3	16	18	21	16	24	5	4	4
Asphalt Distributors	79	2.1	10	11	14	22	28	15	6	10
Self-Propelled Rollers & Compactors	400	4.8	12	15	15	23	24	11	6	10
Welding Machines	630	4.9	9	15	24	26	20	6	5	10

MACHINERY INVENTORY—Above are selected equipment categories and the number and ages of units in the hands of 186 contractors who answered a CM&E survey. These contractors' total investment in equipment, based on original cost, is $166,786,000. On this they have accumulated depreciation reserves of $94,202,000. They signed 2,993 new contracts in 1957, permanently employ 15,575 men, and have supervisory staffs of 3,662. Equipment maintenance expense totaled $28,185,000. Other survey results on p. 136.



ARE DEPRECIATION RATES REALISTIC? . . .
continued

Now, what does all this signify as far as the contractor is concerned. The fact that his reserves on an original investment basis are insufficient may reflect careless depreciation or maintenance policies. But probably to a far greater extent it indicates that he has worked his machines a lot harder, and thus actually depreciated their value through use a lot faster, than he has been allowed to depreciate them on tax returns. It also may indicate that salvage value as insisted on by IRS is unrealistic.

The shortfall of depreciation reserves to cover equipment replacement costs is due to the foregoing reasons, too. But the situation is further aggravated by the rapid rise in equipment prices, which have advanced more than 20% since the summer of 1955. For, even assuming reserves are equal to original equipment cost, it takes before-tax profits of more than $2 to finance each $1 of replacement-cost differential because of the income tax setup.

There have been many proposals to make depreciation practices more realistic. One would extend use of faster write-offs, now confined to new equipment, to used machinery.

On the question of useful lives of machines, Bulletin F sets the span over which equipment should be depreciated—and was last revised in 1942. Theoretically Bulletin F's tables have been suspended and a new schedule has been before the Secretary of the Treasury for months. But until a new policy on service life for depreciation is approved, the old Bulletin F is the only guide available to IRS field agents. Presumably, any revision would shorten presently stated useful lives and thus result in larger annual depreciation allowances.

Changes in methods of depreciation have been proposed, too. One would substitute a bracket system for the detailed tables of Bulletin F. Depreciable property would be broadly classified in brackets having various maximum depreciation rates, below which the taxpayer could select his own schedule.

A scheme of this type is in effect in Canada. There, maximum write-off for construction machinery is 30% per year. And the contractor can vary the amount of depreciation claimed from year to year, provided he doesn't exceed the maximum.

Two new proposed methods are concerned with replacement costs. One would base depreciation on full replacement cost rather than original cost. But this would be extremely costly to the Treasury for it would amount to a tax forgiveness on individual accounts, rather than a postponement of tax liability as with other proposals.

A more practical version permits a "reinvestment depreciation allowance" reflecting the rise in replacement cost when an old asset is retired and a new investment in plant or equipment is made. The special allowance, taken in addition to normal depreciation in the first year, would be deducted from the cost of the machine to determine its normal depreciation base.

Making depreciation rules more realistic will benefit the contractor many ways. Faster recapture of his original investment in his machines will conserve working capital to be used for expanding or purchasing more productive machines. Better machines enable him to compete more successfully. And by offering a customer a better price, he can help expand the total construction market. Indeed, depreciation reform is a prime requisite if the contractor—and the country—is to modernize for growth and profit.

continued on page 140

The Depreciation Picture

CONTRACTOR SIZE (Contracts in year 1957) →		Under $500,000	$500,000 to $1 million	$1 million to $2 million	$2 million to $5 million	Over $5 million	All
Number of Contractors Replying:		26	37	49	45	29	186
Number of New Contracts in 1957:	Median	3	5	10	15	14	
% of Jobs over 100 miles fom home office:		56	78	67	88	94	
Number of Permanent Employees:	Median	10	15	30	50	100	
Number of Supervisory Employees:	Median	3	6	7	12	35	
Equipment Investment Range: (Thousand $)	Low	35	46	25	82	173	
	Median	125	266	474	700	1,488	
	Average	206	354	536	890	2,830	
	High	900	1,094	1,500	5,060	12,100	
Depreciation Reserve Range: (Thousand $)	Low	10	20	13	41	62	
	Median	77	160	265	400	906	
	Average	116	206	308	540	1,600	
	High	700	750	1,020	3,766	7,650	
PERCENT OF CONTRACTORS REPLYING							
Are reserves adequate to recover original investment?*	Yes	38	43	50	47	80	54
	No	62	57	50	53	20	46
Percent too low:	Median	20	20	20	20	20	
Are reserves adequate to cover replacement costs?*	Yes	11	13	10	10	12	11
	No	89	87	90	90	88	89
Percent too low:	Median	27½	25	25	27½	25	
Do you use faster write-offs permitted since 1954?	No	23	21	18	16	23	20
	Yes, some machines	35	35	42	38	32	37
	Yes, most machines	19	11	24	14	11	16
	Yes, all machines	23	33	16	32	34	27
Faster Write-off has helped:							
Working capital position		45	67	63	64	55	61
Machinery buying		34	44	49	54	40	46
Profits after taxes		45	28	28	28	25	30
Bulletin F useful-life standards are:	About right	28	15	17	16	4	16
	Too short	19	6	17	18	8	14
	Too long	53	79	66	66	88	70

*After allowing for resale or realistic salvage value.

VICKERS® OIL HYDRAULICS

BUILT AROUND THE WORLD

THESE NAMEPLATES MEAN WORLD-WIDE AVAILABILITY OF SERVICE, PARTS AND UNITS OF CONSISTENT QUALITY

When you use Vickers hydraulics, you can send your machinery almost anywhere in the free world with assurance that consistent quality service units will be available.

Vickers manufacturing facilities, as indicated by the nameplates above, are strategically located convenient to industrial centers around the world. Vickers consistent quality and parts interchangeability are maintained through a systematic program of inspection and test by the parent organization. Any component built in one plant will be compatible with components and systems from all other plants.

These are added advantages to you when you specify Vickers hydraulics on your machinery for export or for your machinery built overseas.

FOR FURTHER INFORMATION PLEASE WRITE FOR BULLETIN 5500

VICKERS INCORPORATED
Division of Sperry Rand Corporation
INTERNATIONAL DIVISION
Administrative & Engineering Center
Detroit 32, Michigan

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TROJAN 404

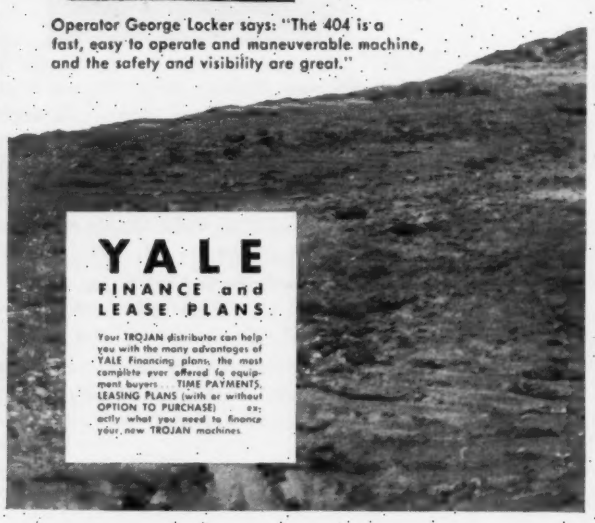
"Handles Machines

"Our 404 is doing a wonderful job for us," the Plant Supt. goes on to say. "It gives us more production at less cost than the 2 loaders and 2 trucks that it replaced." . . . A look at the jobs performed by the big 404 at the Daniel Goff Co., Inc. foundry sand and clay plant at Millville, N. J. shows a good basis for his enthusiasm. The 4 cu. yd. Trojan* keeps the 25 ton hoppers loaded on a cycle that includes *a 1 mile run.* . . . It loads trucks at the sand pit area a half mile from the plant, loads gondola cars

George Locker
Operator

Joe DiPasquale
Plant Supt.

Operator George Locker says: "The 404 is a fast, easy to operate and maneuverable machine, and the safety and visibility are great."



YALE
FINANCE and LEASE PLANS

Your TROJAN distributor can help you with the many advantages of YALE Financing plans, the most complete ever offered to equipment buyers. TIME PAYMENTS, LEASING PLANS (with or without OPTION TO PURCHASE) . . . exactly what you need to finance your new TROJAN machines.

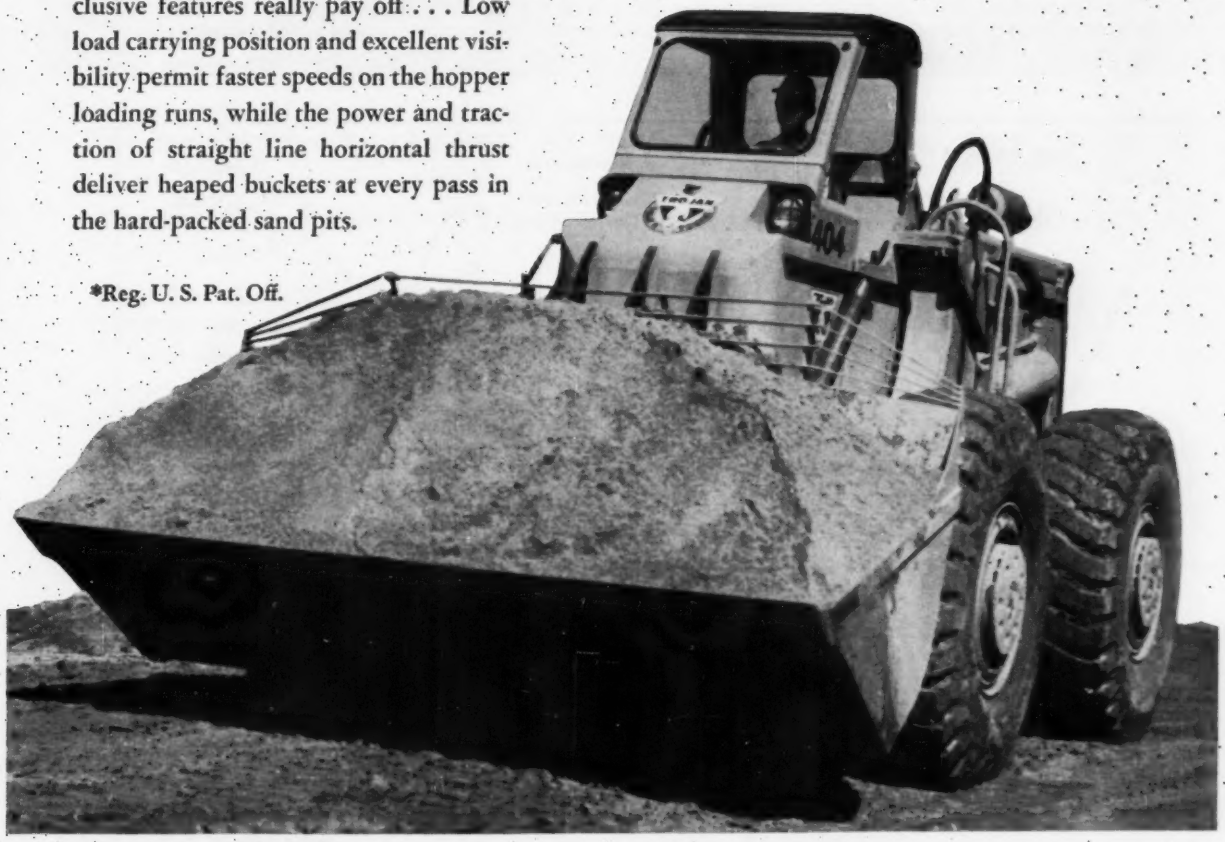
AN REPLACES FOUR!

More Yardage Than The Four It Replaced",

Says: **Joe DiPasquale, Plant Superintendent**
Daniel Goff Co., Incorporated

at the railroad siding and maintains the sand and clay stockpiles—previously a full time job for a man. With this long-run, fast-working schedule, Trojan's exclusive features really pay off . . . Low load carrying position and excellent visibility permit faster speeds on the hopper loading runs, while the power and traction of straight line horizontal thrust deliver heaped buckets at every pass in the hard-packed sand pits.

*Reg. U. S. Pat. Off.



TROJAN* | **TRACTOR SHOVELS**

*REG. U. S. PAT. OFF.

YALE & TOWNE | **2 & 4 Wheel Drive Front End Loaders**

TROJAN DIVISION, THE YALE & TOWNE MANUFACTURING COMPANY, BATAVIA, NEW YORK, SAN LEANDRO, CALIFORNIA

ARE DEPRECIATION RATES REALISTIC . . . **continued from page 136**

What Contractors Think About Present Depreciation Rules

Here are some selected comments from CM&E's survey of machinery depreciation practices. Following the contractor's remarks are his home state and the amount of his investment in construction machinery (original cost in round figures).

"We could not survive on more than a five-year basis for depreciation. We have equipment that we have used for more than five years. And in most cases the cost of maintaining is as much or more than it would cost to abandon it and buy new. However, like most contractors, the problem that faces us is financing, and not many have the money to purchase new equipment to replace their plant. If the government required more than 5% salvage value we would consider very seriously selling our equipment and liquidating—notwithstanding the fact that we have been contractors for 36 years and have plenty of steam left for many years more." ***(Maryland—$2,500,000)***

"'Useful life' does not take into account that useful and profitable do not mean the same thing. An equipment owner and operator must make a profit on the use of his tools, or quit. Old machines while useable, still will not make a profit in the face of natural and normal competition." ***(Oregon—$1,800,000)***

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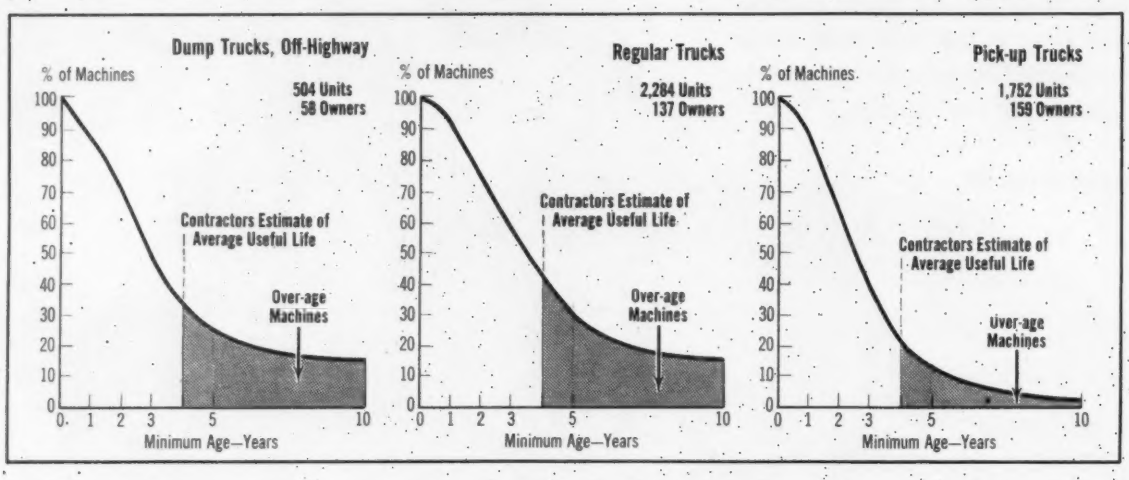

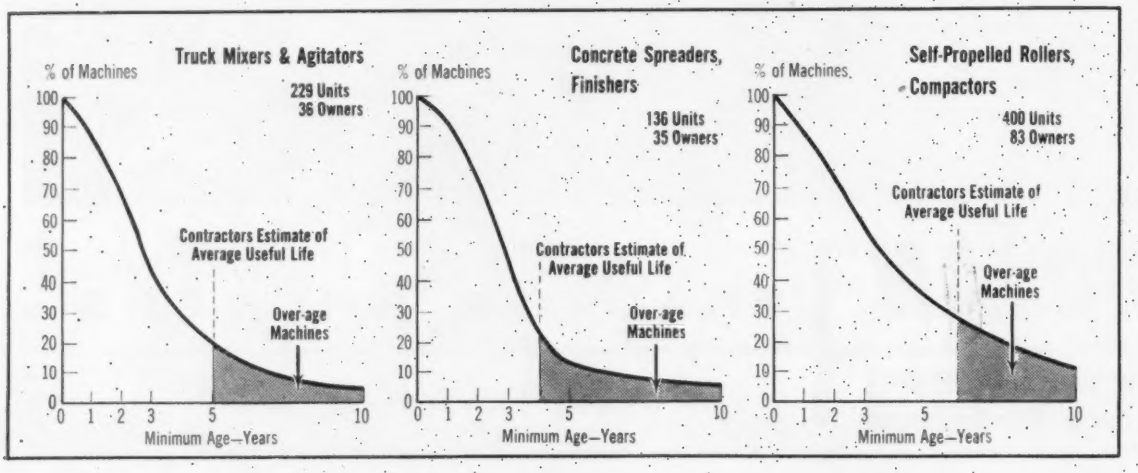

Even with peak pressure

Permalube Gear Oil wins when the going gets tough

Permalube Gear Oil (SAE 80, SAE 90, SAE 140, SAE 250) is a superior compounded gear oil made from carefully selected base oils and proven additives. The blend of selected base stocks results in a gear oil with exceptionally high stability and high viscosity index. The proven additives insure non-corrosive, non-foaming and high anti-weld properties.

Permalube Gear Oil is recommended for enclosed gear trains in earth-moving equipment, and industrial applications, bus and truck transmissions and differentials, where the recommendations call for extreme pressure (EP), hypoid (HP) or multi-purpose (MP) type lubricant. It is recommended for many passenger car transmissions and differentials.

Permalube Gear Oil readily passes the low speed-high torque axle test which makes it the ideal gear lubricant for heavy duty earth moving equipment. It also passes the high speed-low torque axle test with flying colors which makes it, without question, outstanding for passenger car service.

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Vesuvius "X" Gear Compounds

Sloped trench licks cave-ins on Denver waterline

Digging 6 feet deep in loose sandy loam, this Cleveland 240 sloped trench from 90-inch top width to 34-inch bottom width, eliminating serious cave-ins. Picture shows its 30-inch wide, power-shift conveyor easily discharging the large-volume spoil.

Owner Fred Linneman of Denver uses his versatile 240 on many different types of trenching jobs, averages 20 feet of trench per minute on small mains and service lines in this area. Transport is no problem since the 240 is only 8 feet wide overall and its conveyor power folds to within this width.

The Cleveland 240 digs down to 6'3" deep, covers a wide range of trench widths. Get full information now.

Good Everywhere®

The CLEVELAND TRENCHER Co.

20100 St. Clair Avenue • Cleveland 17, Ohio

PLAN '59 FOR WHAT'S AHEAD

WHAT CONTRACTORS THINK ABOUT PRESENT DEPRECIATION RULES . . . continued

"Because of technological improvements, a piece of equipment becomes obsolete before it is fully depreciated. For example, electronic controls make batch plants 6-7 years old useless in light of present-day specifications." ***(Michigan—$3,000,000)***

"Depreciation methods are unrealistic because too few agents have any sound knowledge of the problems of economic obsolescence and the relation between equipment ownership costs and equipment revenue." ***(California—$1,000,000)***

"Used equipment should be depreciated by the double-declining-balance method. Bulletin F is ridiculous. The life of machinery shown is often four times, and always at least twice, our normal useful life." ***(North Carolina—over $5,000,000)***

"Depreciation based on cost during a period of rapidly increasing costs results in an overstatement of profit, overpayment of income taxes, and dissipation of invested capital." ***(Georgia—$3,500,000)***

"The depreciation schedule should be changed to allow for the inflationary trend of the replacement cost. Bulletin F is not fair in its schedule of crawler loaders, tractors, or shovels. This type of equipment encounters rougher usage and, as a result, ownership costs have to include 100% repair costs by the time the machine is fully depreciated. The government should ask contractors rather than equipment manufacturers about useful life." ***(Indiana—$354,000)***

"The local office uses different figures for different contractors, mainly based on maintenance. You are penalized for good maintenance by having your years of useful life extended. Set up definite life such as 4-6 years on contractors' equipment on medium work, shorter on rock work, longer on dirt work. Take some power away from the IRS agent who doesn't understand the facts and is obviously only interested in collecting money." ***(Colorado—$1,250,000)***

"On the whole, Bulletin F is adequate for stationary machinery but not for construction machinery. Every type of job requires adjusted depreciations in roadbuilding equipment." ***(Virginia—$1,800,000)***

"Full cost should be depreciated without salvage value deduction." ***(Alabama—$1,500,000)***

"Useful lives in Bulletin F are too long because:
1. Time limits and liquidated damages in contracts and the need for increased production to reduce over-all cost usually require multishift operation, which is much harder on equipment and reduces its useful life.
2. Equipment is being improved and new equipment developed to such an extent that old equipment becomes obsolescent long before it is worn out. Contractors can't afford to use the old equipment any longer because newer equipment increases production." ***(Oklahoma—$890,000)***

"We are now threatened with salvage value for past years as well as future years, for which we see no necessity." ***(Kentucky—$2,400,000)***

"The depreciation rates allowed are not as objectionable as the arbitrary way they are administered." ***(Tennessee—$780,000)***

"Depreciation should have some relation to replacement values rather than cost." ***(Texas—$2,000,000)***

"Salvage value is too high. We object strenuously to the department's right to change rates after selling used equipment." ***(South Dakota—$1,500,000)***

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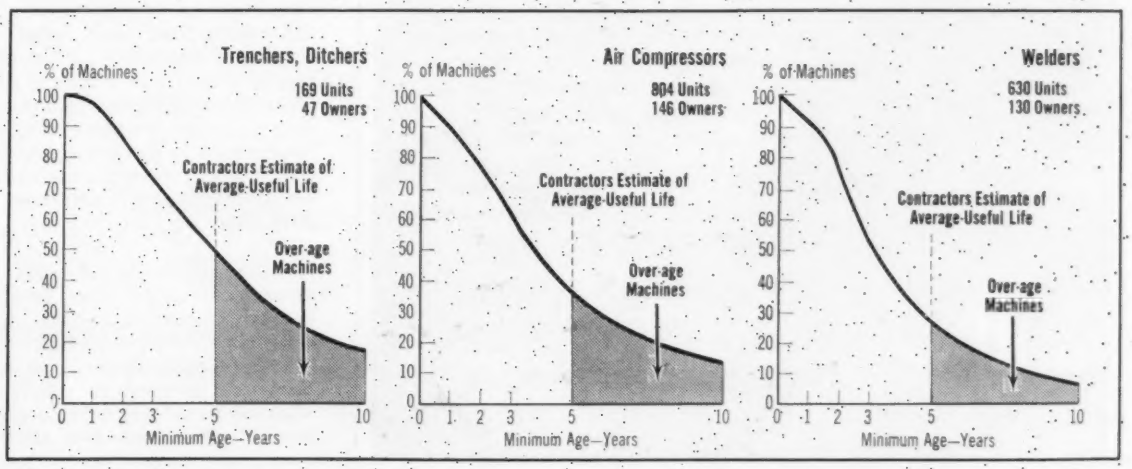


PLAN 59 FOR WHAT'S AHEAD

WHAT CONTRACTORS THINK ABOUT PRESENT DEPRECIATION RULES . . . continued

"Bulletin F must be designed for small cellar diggers. Road contractors' equipment gets real hard use 12 months of the year." ***(Rhode Island—$1,500,000)***

"Bulletin F does not give effect to rapid wear and tear on machinery caused by today's terrific pace to meet rugged competition. This involves more work hours for equipment in a given day than usually allowed for." ***(Michigan—$900,000)***

"Present depreciation methods are a joke. Replacement costs are usually so much greater. A $40,000 machine, fully depreciated, still costs you $20,000 because that's all you saved on income taxes. The Infernal [sic] Revenue Bureau should furnish the machines in efficient operating condition and we would gladly pay to them, as rent, the rate of depreciation they allow us." ***(Maryland—$600,000)***

"There is confusion between 'useful life' and how long a given piece of machinery can be kept together. An admittedly short 'useful life' for tax purposes would stimulate purchasing of new equipment." ***(Iowa—$1,000,000)***

"Not realistic for the industry. Some allowances should be made between short-season contractors in the North as against Southern operators." ***(Illinois—$750,000)***

"We have had no trouble and don't expect any. Those loudest in protest are the ones trying to use depreciation for capital gains profit, which is not its purpose. We do not use equipment very hard, so most pieces last as long as Bulletin F lives." ***(Maryland—$70,000)***

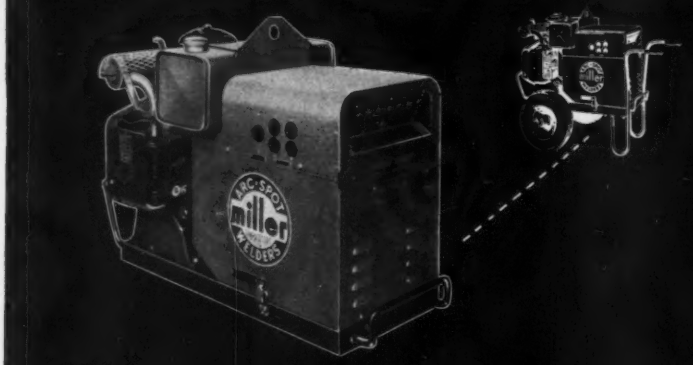
"Would be reasonable if a reasonable interpretation of useful life and salvage value was made by examining agent. Actual useful life for a progressive organization would be 50% to 60% of that suggested in Bulletin F. ***(Oregon—$750,000)***

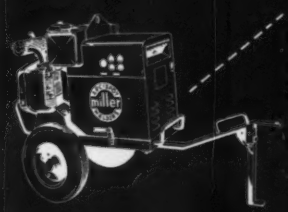
"IRS is interested in collecting a tax now without regard to the future." ***(California—$250,000)***

"Depreciation seems to be the examiner's most used means of creating a deficiency for the taxpayer, if no other means is possible. Bulletin F based on premise that the larger the equipment, the longer its life. Larger equipment will produce more but not necessarily last longer." ***(Montana—$800,000)***

"Allowance should be made for equipment usage after original cost is recovered, because new equipment costs rise as time passes. The allowance would be similar to percentage depletion allowed on oil and mining properties." ***(Minnesota—$665,000)***

NEW!





Now equipped with a new and larger Onan 12.9 hp engine, the new Miller AEA-200-L produces a full 225 amperes of continuous rated, high cycle welding current or, 5 KW of 110/220 ac power for operation of power tools, lights, milking machines, etc., or, 1 KW of dc power.

Contractors, job weldors, farmers and many industries have shown a continuing high regard for the AEA's weatherproof ruggedness, easy portability and instant changeover versatility from ac welder to power plant to pipe thawer.

Readi-pull starter, rubber tire running gear and road trailer available as optional equipment.

Complete specifications sent on request.

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LIGHTER THAN A WALKIE-TALKIE!

CONVENIENT AS A "WRIST" RADIO!

a NEW transistorized miniature 2-way "Belt" Radio

RCA Personalfone

The 2-Way Radio You Wear!

Today's biggest news in the communications field! The same communications mobility for roving personnel as RCA 2-Way Carfone Radio gives to trucks! Small transistorized receiver and a companion transmitter in two handy leather pouches that are worn on the user's belt. Personalfone can be combined with RCA mobile radio to provide faster and more flexible communications. Used by guards, watchmen, maintenance men, mechanics, firemen, police and a wide range of applications.

RCA Personalfone Transistorized FM Radio

- **Adjustable to any frequency in the 150 mc band.**
- **Receiver and transmitter in separate leather pouches.**
- **"Battery Saver" provides long battery life—150 hours minimum.**
- **Sealed-selectivity-fixed IF filter and crystal control assure excellent selectivity and stability.**
- **Equipped with antenna, battery, microphone, speaker or earphone.**

RCA...world leader in radio... offers you quality communications equipment to meet every requirement. Advanced engineering means greatest satisfaction, lowest maintenance. Expert service by RCA's own communications technicians. Find out about this efficient time-saving equipment today. Use coupon.

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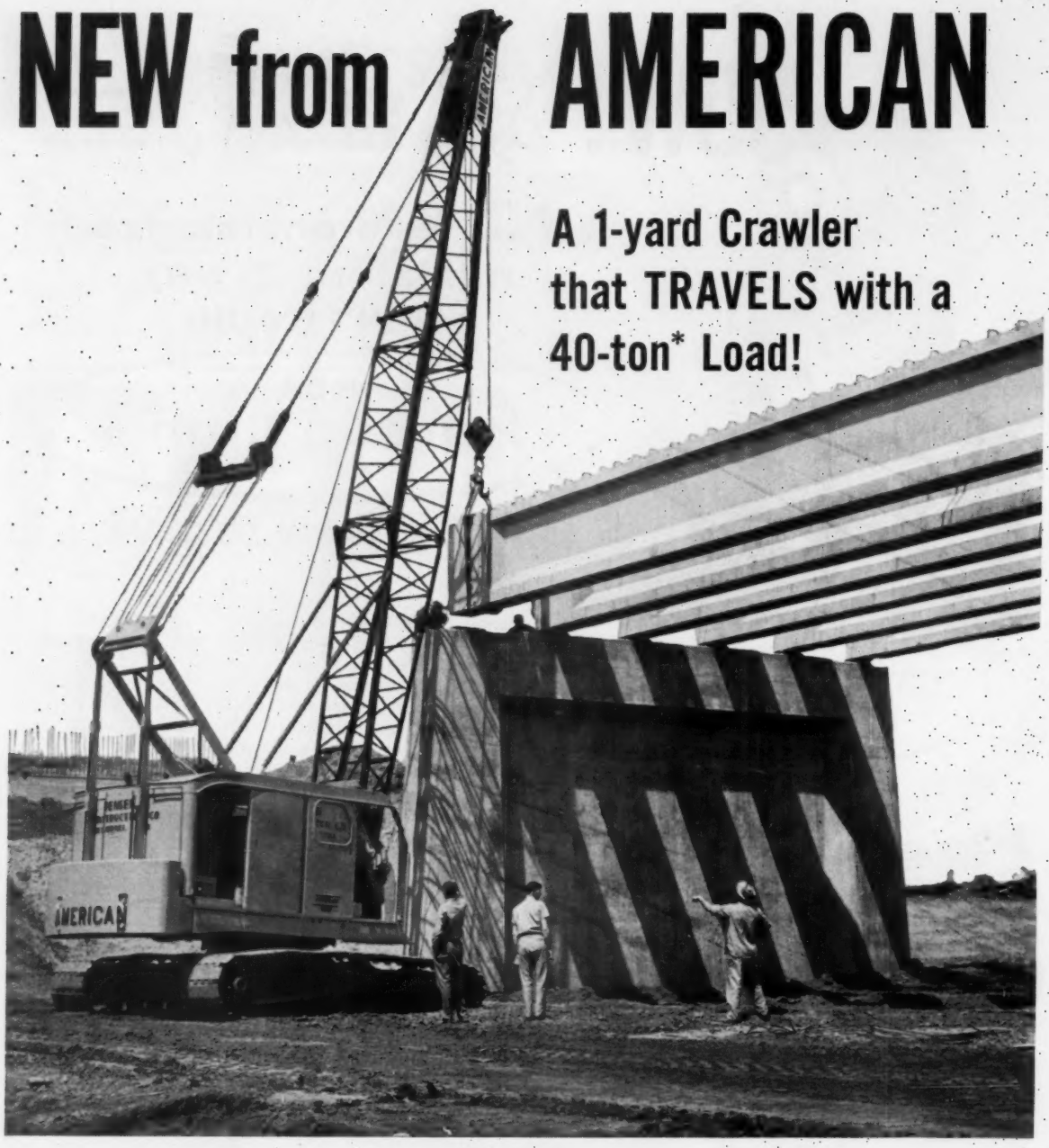
NEW from AMERICAN

A 1-yard Crawler that TRAVELS with a 40-ton* Load!



It's Another AMERICAN First!

Exclusive extendable crawler side frames that let you: Haul—Travel—Work at 11-foot width on routine jobs, Travel—Work at 13-foot, 10-inch width for heavy work!

For excavating work, American 500 Series Crawlers offer 1-yard capacity with shovel or backhoe . . . 1½-yard capacity with clam or dragline. It's a 40-ton capacity crane for steel erectors.

Distributors have complete details on dozens of special features offered in this new crawler line. Investigate the 500 Series and the complete American line with capacities that start at ½-yard, 12½ tons.

*Rated at 75% of tipping in accordance with U.S. Department of Commerce Commercial Standard CS90-58.

EXCAVATORS-CRANES to 2 yds.-50 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons

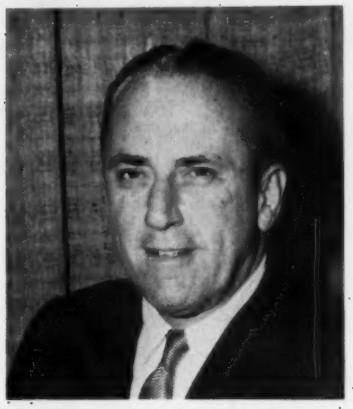
AMERICAN HOIST
and Derrick Company
St. Paul 7, Minnesota

AMERICAN HOIST PACIFIC COMPANY
Special materials handling equipment

CROSBY-LAUGHLIN DIVISION
Drop forged fittings for wire rope-chain

Construction Men in the News . . .

Psaty & Fuhrman



IRVING L. LAZERE is the new executive vice president of Psaty & Fuhrman, Inc., New York building contractors.

Lazere, former president of the Public Building Contractors Association, and the Building Contractors and Mason Builders of New York, is a member of the board of governors and chairman of the Legislative Committee of the Buildings Trades Employers' Association. He was vice president of Lazere Construction Corp., New York.

F. H. McGraw

JOEL M. MORRIS, assistant to the president and chief engineer of F. H. McGraw & Co., engineers and constructors, has been made a vice president of that firm. Morris will maintain offices in New York City and will devote most of his time to new engineering and construction developments.

While chief engineer, Morris supervised the engineering of a number of important industrial projects including a complete aluminum complex, a high-energy fuel plant, and other chemical and metallurgical projects. He formerly was a member of the executive reserve of the Office of Minerals Mobilization for the Department of Interior.

Dravo

H. E. LORE is the new manager of the engineering and construction department of the Dravo Corp. machinery division.

Lore joined Dravo in 1936 as an engineer and served in various engineering and operating capacities in the company. He became operations manager of the engineering and construction department in January, 1955.

The engineering and construction department specializes in the building of power plants, pump houses, waste disposal plants, gas regulating stations, water and gas pipelines, boiler houses and similar installations.

Maxon

WILBER L. JENKS is a new vice president of the Commercial and Industrial Building Department, Maxon Construction Co., Dayton, O. Other new executive committee additions include Joseph C. Smith, named vice president of the Power and Nuclear Facilities Department, and Thomas J. Scott, vice president of the Marine and Heavy Construction Department.

Austin

EDMUND W. HOLLISTER is a new assistant manager of the Austin Co.'s 14-state Cleveland District.

Hollister joined Austin as an equipment engineer at its New York district in 1940 and in 1943 was given charge of all mechanical installations at the $50-million Chicago Army Aircraft plant where Douglas Aircraft built C-54's during World War II.

Perini

ELIOT FARLEY JR., is the new executive vice president for administration and finance of the Perini Corp., Framingham, Mass.

Farley also will supervise the company's new program of diversification through land development and acquisition of manufacturing and other industrial enterprises.

Farley is president and treasurer of the American Anodizing Corp., Quincy, Mass., and executive vice president and treasurer of the U.S. Gear Corp., Wakefield, Mass.

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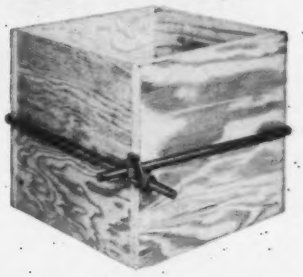
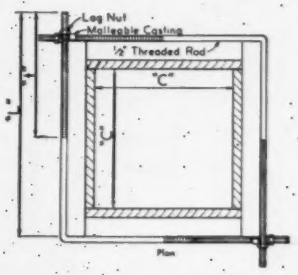
FAST FORMING FOR CONCRETE COLUMNS with reusable Richmond Challenger Column Clamps



Reusable Richmond Challenger Column Clamps are simple, economical two piece clamps made from 1/2" diameter steel rods. The corner castings are malleable iron designed for quick engagement. Adjustment to correct size is easy because of the coarse thread and nut at each end of the rod.

Challenger Column Clamp

Multi use, at minimum depreciation, eliminates repeated material costs for each column. There is no material loss. Richmond Challengers are light in weight and help you to save time, labor and materials in the erection of forms for concrete columns from 8"x8" to 24"x24" in width.



A "U", rather than a hole, is provided in the malleable casting. This "U" allows you to lay the connecting rod into position. A few turns of the nut securely tightens the rod to the form.

Richmond has a full line of form tying devices. These and more than 400 other Richmond-engineered Tying Devices, Anchorages and Accessories, applicable for all types of concrete construction, are shown in detail in the current Richmond Handbook. Send for your copy—and if you have a specific concreting problem, write to:

Another Winning Combination

CLARKLIFT* 40 and CONTINENTAL RED SEAL POWER

CONTINENTAL
F4162 Engine

DISPLACEMENT
162 cu. in.

HORSEPOWER
49 at governed speed of 2,200 rpm.

MAXIMUM TORQUE
123 lb. ft.
Available also for use on LP fuel

For years, the experience of users has underscored one fact: for day-after-day dependability, this Clark-Continental work team is mighty hard to beat. In the new Clarklift 40, as in numerous other Clark models that are gaining ever-wider acceptance in the industrial and construction fields, Clark Equipment and Continental Motors have joined hands, with outstanding results. Their engineering experience and manufacturing skill are producing specialized machines that speed the work and cut the cost on a steadily-lengthening list of jobs. And while they vary widely in size, in power, in purpose, these units have in common an amply-proved capacity to operate day in, day out, with a minimum of costly down-time.

ANY EQUIPMENT IS BETTER WITH CONTINENTAL RED SEAL POWER

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Corps of Engineers

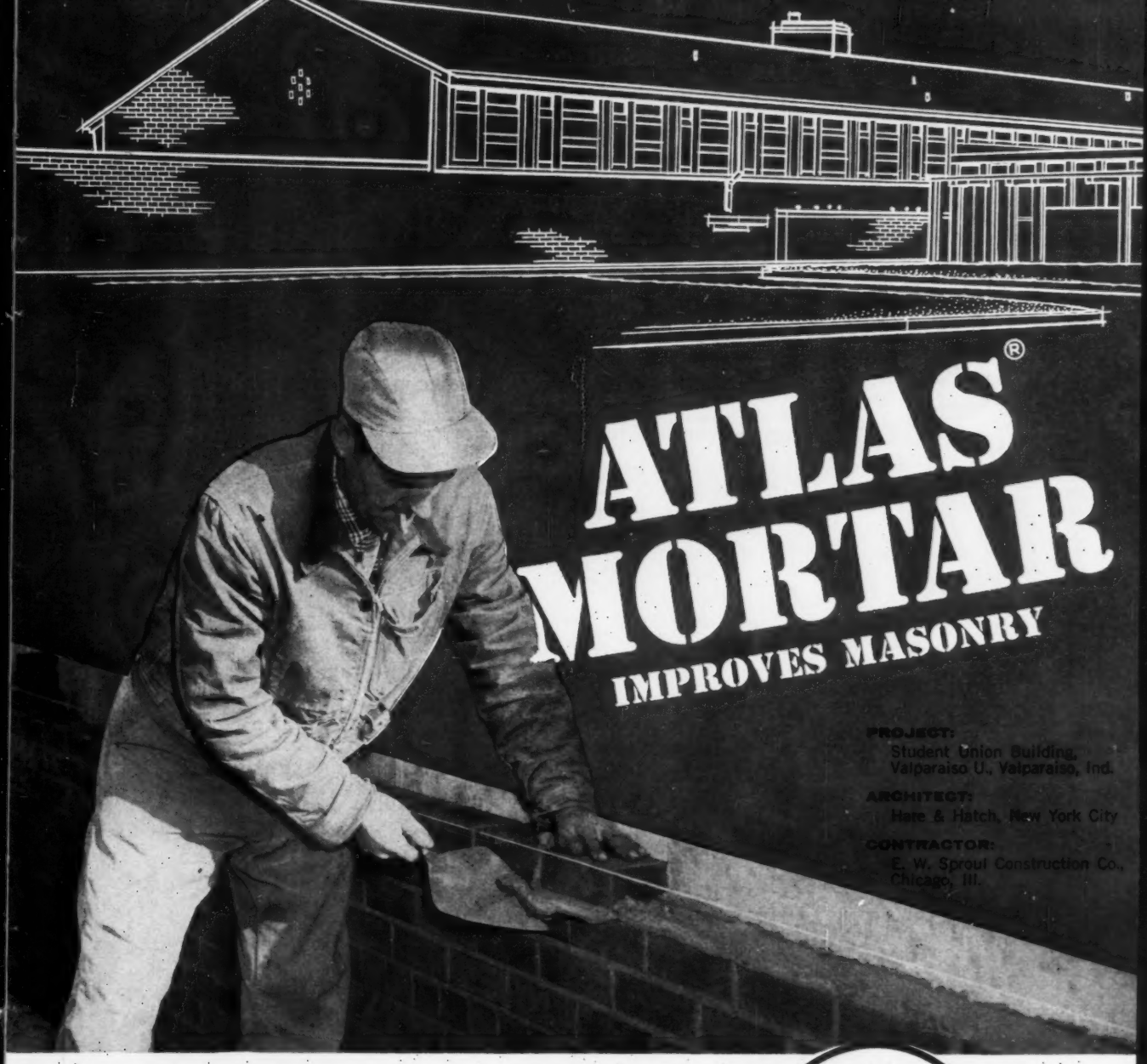
COL. CARLIN H. WHITESELL (left) is the new District Engineer, Eastern Ocean District. He replaces COL. ALDO H. BAGNULO (right) who goes to the U.S. Army Engineer Center at Fort Belvoir, Va.

Lt. Col. Frank A. Gerig, jr., becomes new executive officer of the Philadelphia District. He recently was head of the Delaware River Report Group making a comprehensive survey of the water resources of the Delaware River Basin.

Maj. Howard W. Durham, jr., becomes assistant to the district engineer, Philadelphia, for civil works. He previously was with Headquarters, 3rd Armored Division, Germany.

Lt. Col. Raymond A. Seifert goes to the New England Division as assistant division engineer and executive officer to Brig. Gen. Alden K. Sibley, division engineer.

THE UNITED WAY



"...best in workmanship...best in strength,"
says Henry Gagne, Masonry Foreman,
E. W. Sproul Construction Co.

- Mortar in masonry construction must resist the destructive effects of weather in any climate.
- Because ATLAS MORTAR is an *air-entraining* masonry cement, it produces a durable mortar that strongly resists deterioration due to weather.
- Quality-controlled manufacture of ATLAS MORTAR cement maintains high product standards, assures uniform performance and appearance on every project.
  (Complies with ASTM and Federal Specifications.)

Write for your copy of "Build Better Masonry,"
Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.

M-72

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Universal Atlas Cement
Division of United States Steel

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TRADE-MARK

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From one to a fleet

with Allis-Chalmers Construction Machinery

Starting with a single tractor-dozer in 1949, R. Sam Krage Company of Sioux City, Iowa, now owns a fleet of Allis-Chalmers construction machines. Sam Krage attributes much of his success as a dirt mover to the operation and performance of his equipment, and to the top-notch service his Allis-Chalmers dealer provides.

Sam Krage, Sioux City, Iowa

Big TS-360 motor scrapers are heaped to 20-yd capacity with help of the 225-hp HD-21 crawler tractor. Krage especially likes the ease with which these machines handle wet dirt.

Look ahead... *move ahead*...and stay ahead

Top production, day after day makes Allis-Chalmers tractor-dozers, like this HD-11 shown spreading fill, Krage's choice.

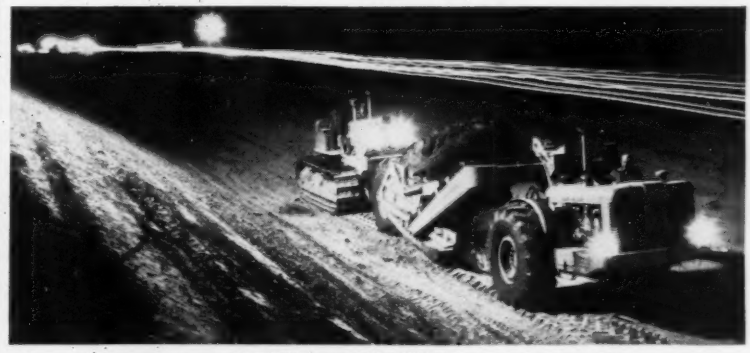
Top production record on a wide variety of jobs

From small farm pond and dam construction with his first tractor, Krage branched off into clearing work for highway contractors. Since then he has moved into highway grading himself, both in Iowa and South Dakota. He also has done levee work on the Missouri River, and most recently handled a big air base job at Sioux City.

In this wide range of construction jobs, Sam Krage says he has benefited from an outstanding "time-on-the-job" record from his Allis-Chalmers equipment. Best proof of his confidence is the well-balanced fleet of Allis-Chalmers machines he now owns . . . big motor scrapers, crawler tractors, pull scrapers, and heavy-duty motor grader.

A number of the motor scrapers are TS-260's—rated 11 yd struck, 14 yd heaped. On a recent 800,000-yd highway job in Iowa, Krage says these machines loaded, hauled and dumped at the rate of 55 trips an hour on a 1,400-ft haul. On the Sioux City air base job, his TS-360's (15 yd struck, 20 yd heaped) handled 450 loads a day on average hauls of 1,600 ft.

On air base job, the Forty Five motor grader kept haul roads smooth, allowing the TS-360's to travel safely at high speeds.



Krage's teams of HD-21's and TS-360's kept production rolling on a night operation at Sioux City air base.

Easy handling makes a big hit with operators

Krage says his operators like the way their Allis-Chalmers equipment handles, and that means extra production.

On the air base job, they were able to utilize the top horsepower-per-yard ratios in the TS-360's and TS-260's. Results—even in wet material, they loaded and hauled easily . . . and with positive, forced ejection, plus high apron opening, unloaded fast and clean.

Features designed for the operator's benefit on Allis-Chalmers tractors and motor graders are also considered important by Krage and his men. Torque converter drive on the HD-21 and HD-16 crawler tractors . . . and new toggle-type controls on the Forty Five motor grader are two examples. Both have the same effect—easier operation, more production.

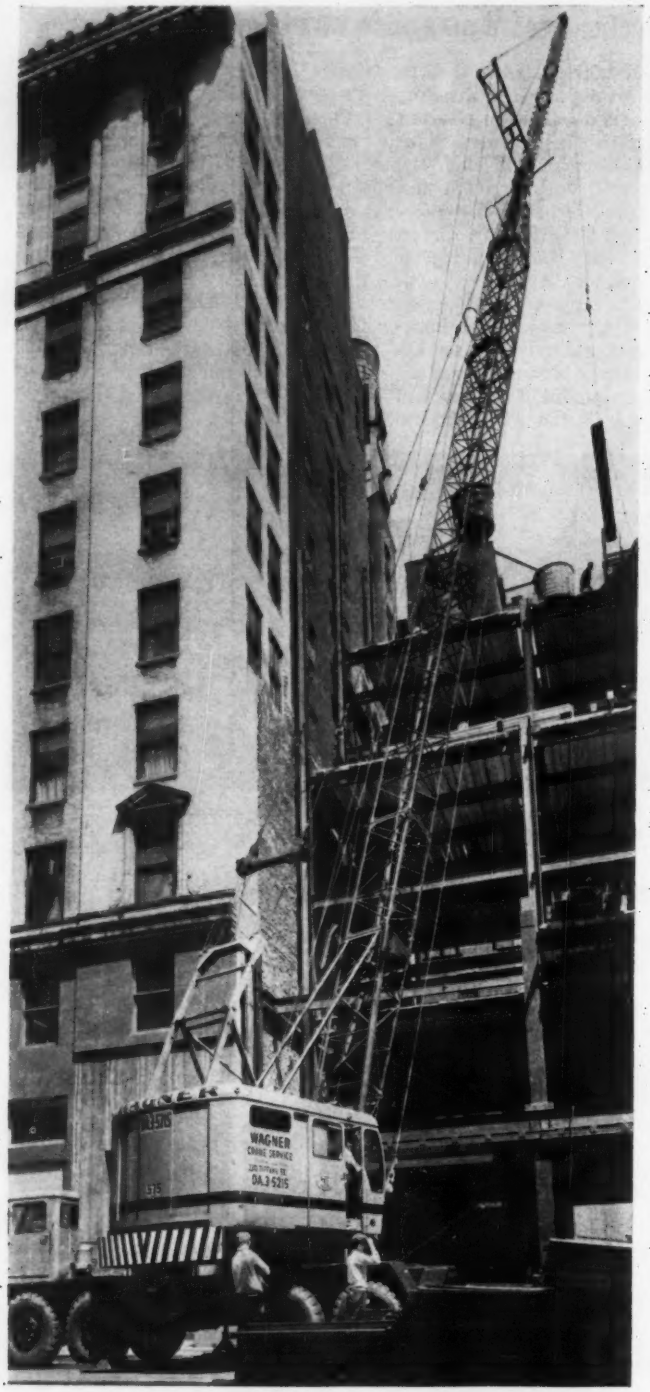
Proved quality in parts and dealer service important factor

Sam Krage made his first extensive purchase of Allis-Chalmers equipment in 1952, was so well satisfied with its operation and performance that he has continued to purchase it.

Krage says that parts availability and prompt dealer service figure high with him in purchasing the type of equipment he needs in his work. In both respects he's had extremely good relations with his Allis-Chalmers dealer.

Your local Allis-Chalmers construction machinery dealer is ready to help you with equipment and application recommendations, around-the-clock parts and service. Call him now for a working demonstration of the performance that sold Sam Krage. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

with ALLIS-CHALMERS



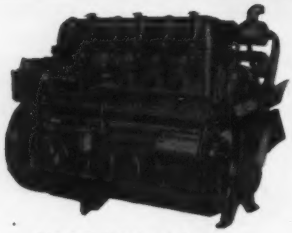
"Power to improve performance and cut fuel costs in half"

Mr. Harry Wagner of Wagner Crane Service, Bronx, N.Y., says, "This is our first experience with diesel power on our cranes. And we are very enthusiastic about our 45-ton P&H 575 Crane powered with two 6-cyl. P&H Diesels.

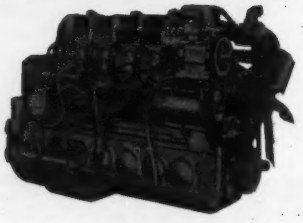
- **"P&H Diesels are more powerful than gas engines. They never stall. Even on an idle engine you can pick up a heavy load.**
- **"They cut fuel costs in half! It takes only $15 to $20 of diesel fuel a week to operate this 45-ton rig.**
- **"Morning starts in cold weather are no problem with P&H Diesels. When it comes to starting, they kick right over.**
- **"P&H Diesels are easy to take care of—all fittings are easy to get at—and all wearing parts are interchangeable."**

Until development of the P&H Diesel, owners had to be satisfied with diesels which did not fully utilize all the potentials of truck cranes that have to idle hours on end. But P&H has changed this situation. Now, when a truck crane picks up a heavy load the P&H Diesel responds instantly —without fouling.

For all your construction equipment, specify the one diesel with all the features that deliver the best in performance and operating economy —P&H Diesel! Write Dept. 415A, P&H Diesel Engine Division, Crystal Lake, Illinois.



6-Cyl. P&H Industrial
Engine for "upper"—205 HP.



6-Cyl. P&H Automotive
Engine for "lower"—280 HP.

P&H DIESELS

Fastest Growing Name in Diesel Power

Sales and Service

Equipment purchasing and servicing takes less time when you know who and where to call. Keep advised of new distributors, sales personnel and other activities.

Distributor Appointments

Bucyrus-Erie Co.: The following four distributors have been appointed: Depco Detroit Corp. of Detroit, Mich.; Construction Service Equipment Company of Omaha and North Platte, Neb.; Hougnton-Arnold Machinery Co. of Portland and Bangor, Me.; and Lounsbury Co. Ltd. of Moncton, N. B., Can.

Yale & Towne Manufacturing Co.: The company has appointed four new distributors for its Trojan tractor shovel line. They are: Scott Machinery, Inc. of Concord, N. H.; Sierra Machinery Co. Inc. of Reno, Nev.; Pelican Machinery Co. of New Orleans, La.; and the W. F. Fuller Machinery Co. Ltd. of Regina, Sask., Can.

Koehring Co.: The Kwik-Mix and Koehring divisions have appointed Machinery Mart of Cleveland, Ohio, as distributor for the complete line of products of both divisions. The Parsons Company Division has named the Texas Machinery & Equipment Co., Inc., of Amarillo, Tex., as exclusive distributor for western Texas. The C. S. Johnson Company Division has named two distributors. They are: A. H. Cox & Co. of Seattle, Wash.; and Wilson Equipment & Supply Co. of Cheyenne, Wyo.

Gardner-Denver Co.: Spreitzer, Inc., of Cedar Rapids, Ia., has been appointed distributor for Gardner-Denver construction and quarrying equipment.

Davey Compressor Co.: The following five distributors have been appointed: Cactus Equipment Co. of Houston, Tex.; Adams Construction Equipment Co. of Orlando, Fla.; Baker Equipment Engineering Co. of Charlotte,

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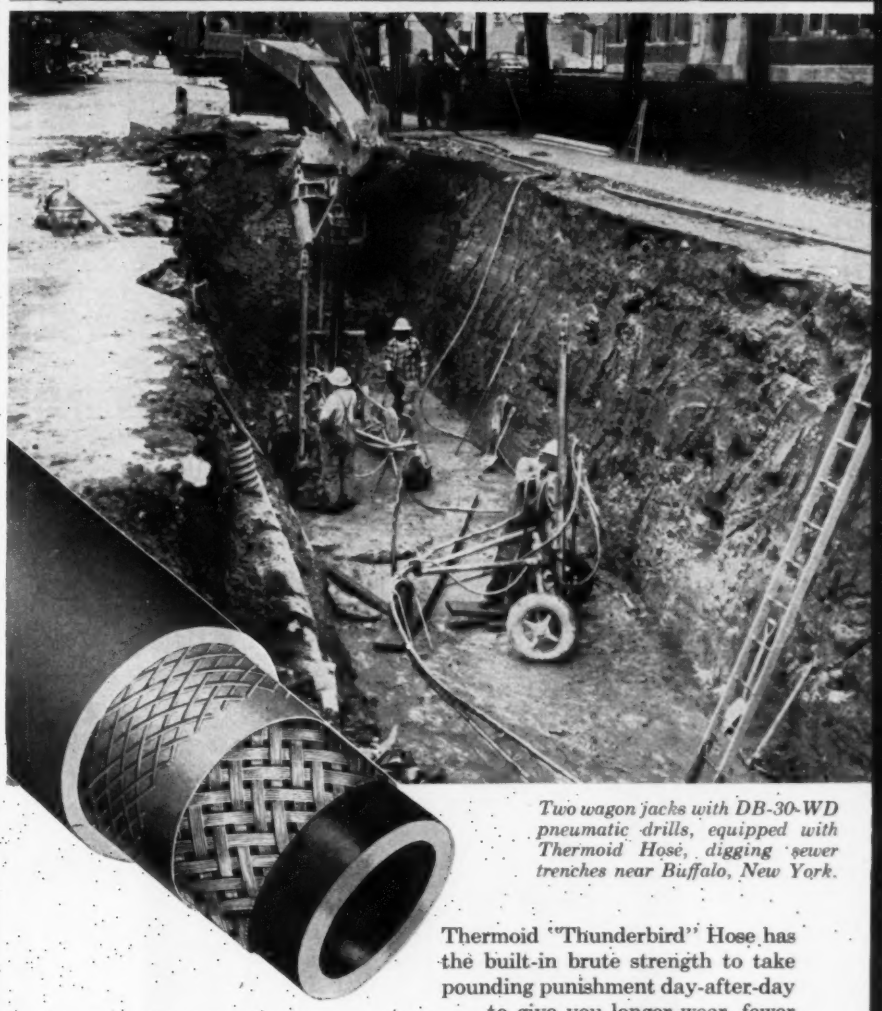
Thermoid Hose is built to take a beating!

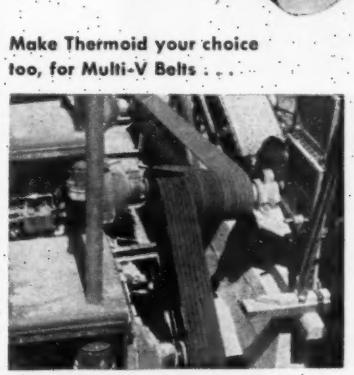


Two wagon jacks with DB-30-WD pneumatic drills, equipped with Thermoid Hose, digging sewer trenches near Buffalo, New York.

Thermoid "Thunderbird" Hose has the built-in brute strength to take pounding punishment day-after-day . . . to give you longer wear, fewer replacements. *You can forget about down-time.*

"Thunderbird" Hose is just one of the Thermoid products designed to help you get the most profit out of your investment in construction equipment. Your local Thermoid Distributor can recommend the Thermoid Hose, Multi-V Belt or Conveyor Belting designed to do a specific job *best.*

Make Thermoid your choice too, for Multi-V Belts . . .



. . . and Conveyor Belting

Thermoid

Thermoid Company
Trenton, New Jersey
Nephi, Utah

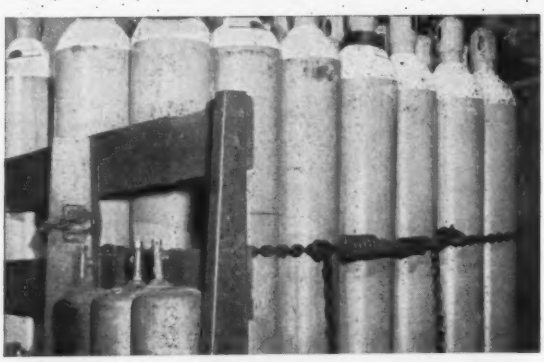
This compact Jaeger Model 2PN, pumps all the water a 2" suction hose can handle. **With 2½" suction hose it pumps more than 14,000 gph.**

Now handle more water with Jaeger pumps

Today's Jaeger Sure Prime pumps deliver performance never before offered—and at slower, long-life operating speeds. For example, a Jaeger 6PH can handle 100,000 gph as a dewatering pump or deliver 975 gpm at 60 psi pressure for well point jetting or gravel washing. Base your pump buying on latest information. See your Jaeger distributor or send for catalog.

THE JAEGER MACHINE CO., 800 Dublin Avenue, Columbus 16, Ohio

AIR COMPRESSORS • MIXERS • PAVING SPREADERS and FINISHERS



LEBUS Snubbing Load Binder secures "SOLID" loads!

Solid loads—gas cylinders, rod cans, pipe, steel, stone, etc., stay put on your truck when they're secured with Lebus Snubbing Load Binders. Re-tightening of chain after load has settled isn't necessary. Rugged coil spring absorbs shocks—maintains full binding tension—dropping back a link is never required! Short throw handle ideal in confined areas. Many features—drop forged binder, ball and socket swivel, locking handle—make Lebus Load Binders first choice of profit-safety conscious truckers. See, *test* this popular binder at mill supply, industrial or construction equipment distributors everywhere. For help with your binding problem, write:

CROSBY-LAUGHLIN *Division*

AMERICAN HOIST & DERRICK COMPANY

FT. WAYNE 1, INDIANA

SALES AND SERVICE

continued

S. C.; S. M. Christhilf & Son Inc, of Timonium, Md.; and Utilities Equipment Company of Memphis, Tenn.

On the Sales Front

Armco Steel Corp.: Armco Drainage & Metal Products has appointed Crosby W. Bean sales manager of the Southwestern Division. He replaces James E. Kunkler who has been named manager of the Central Division of the company.

Upson-Walton Co.: H. B. Korman has been appointed sales manager for the company to succeed the late Edwin D. Baskin.

D. W. Onan & Sons Inc.: Roy E. Mullin has been named general sales manager of the company. Hiram Hascall, former general sales manager and now vice president of sales will retire at the end of this year after 16 yr service in these jobs.

Esso Standard Oil Co.: A. R. Curtis has been promoted to manager of the asphalt sales division. C. F. Boudreau becomes administrative assistant to the asphalt sales manager.

Clark Equipment Co.: Monte Joe Harrison has been appointed district representative for the Construction Machinery Division. His territory includes Texas and Oklahoma. Clarence E. Zermer, who formerly handled that territory, is now covering Oregon, Washington, British Columbia, and Alaska.

Link-Belt Speeder Corp.: N. V. Chehak has been named sales manager in charge of all domestic and Canadian sales for the firm's line of crawler and rubber-tired shovel-cranes and the related diesel pile hammer equipment. D. F. Van de Roovaart assumes the duties of assistant sales manager for U. S. and Canadian territories.

Marion Power Shovel Co.: Three new divisional sales managers have been appointed. Edward K. McGill of the eastern district will handle the New York City metropolitan area. Joseph R. Thurman, also of the eastern district, now covers North Carolina, Virginia, Maryland, the District of Colum-

bia, and several counties in West Virginia. C. D. Torr is Marion's new representative in the state of Michigan.

L. B. Foster Co.: The following three sales representatives have been named by the company: Andrew M. Filak and Paul E. Maisch will join the Pittsburgh office; and George H. Wilshusen will join the Houston office.

Universal Atlas Cement Co.: John T. Hughes has been appointed sales manager of the New York territory. He succeeds William J. Plant who is retiring after 42 yr service with the company.

In the Main Office

Pendleton Tool Industries: Marvin S. Bandoli has been elected senior vice president of the company. He joined the company in 1952 as vice president, marketing.

Worthington Corp.: A. E. Carter joins the company as vice president of manufacturing. He succeeds Leslie C. Ricketts who plans to devote all his time to his job of group vice president of five Worthington operating divisions.

Hyster Co.: Two new vice presidents have been named: Ray M. Ronald will take charge of the Tractor Equipment Division. Frank A. Rostedt will be in charge of all company activities outside the U. S. and Canada.

The Colorado Fuel and Iron Corp.: Charles R. Tyson has been elected executive vice president of the company. He is also executive vice president of John A. Roebling's Sons Corp., a wholly-owned subsidiary.

American Hoist & Derrick Co.: George F. Manikas has been appointed general manager of the Crosby-Laughlin Division. This division manufactures a complete line of drop forged fittings for wire rope and chain.

Atlas Powder Co.: Ralph K. Gottshall has been elected chairman of the board and re-elected president. As chairman of the board he succeeds Isaac Fogg who is retiring after 46 yr of service with the company.

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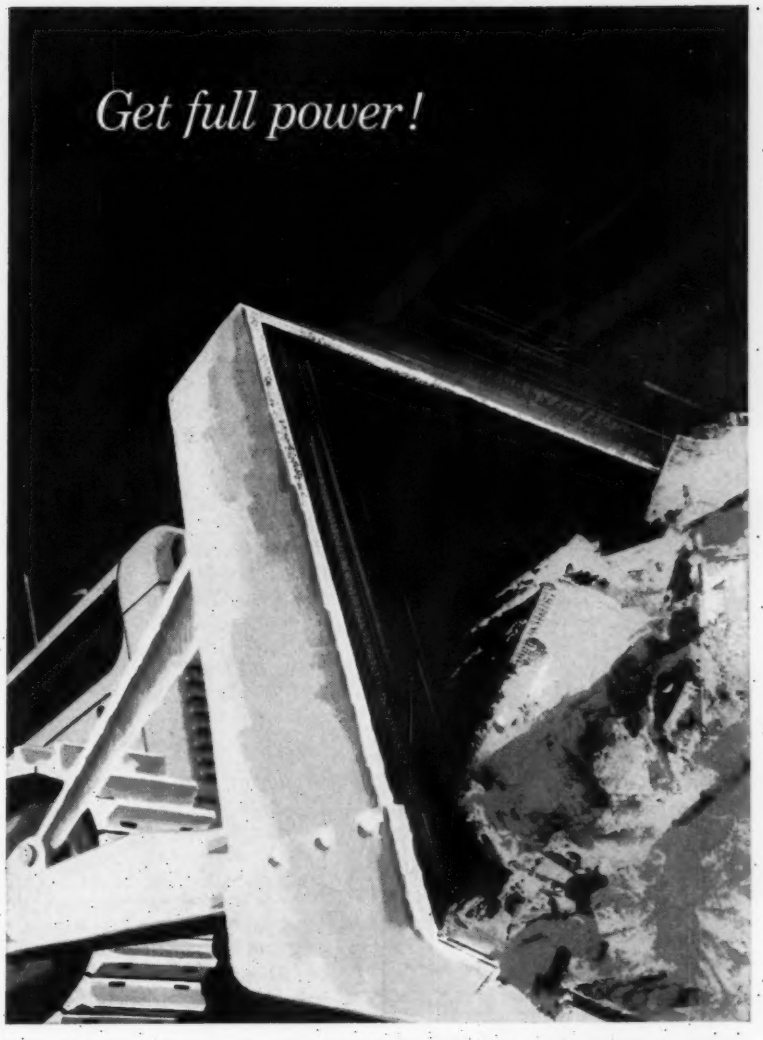


Transmit every pound of usable torque with J-M Friction Facings

Woven J-M Cone Facing being applied to a power take-off unit.

Heavy-equipment operators have discovered that Johns-Manville Friction Facings for clutches efficiently control the tremendous torque output of modern engines. These facings can withstand the searing clutch heats (as high as 1200 F) developed during power engagement . . . heats which can destroy friction ingredients and increase clutch slippage.

J-M Friction Facings, made of the finest asbestos fibers and resins, were specifically engineered for their job. They resist thermal breakdown . . . absorb and pass off sudden heat surges. They quickly bring drive shaft and power take-off units to fullest working torque, prevent loss of engine torque that robs your equipment of speed and power, makes your operation less profitable.

See your J-M Distributor or write Johns-Manville, Box 14, New York 16, N. Y. In Canada: Port Credit, Ont. Ask for Brochure FM 35-A.

JOHNS-MANVILLE

100 YEARS OF QUALITY PRODUCTS...1858...1958

Cites White's ability to "rough it"

Bert Heuvelman, President, Instrument Sales, 3947 W. Lawrence, Chicago —Shown adjusting a David White T8200 Contractors' Transit.

"The real value of a surveying instrument lies in its ability to 'rough it,' " says Bert Heuvelman, President, Instrument Sales.

"It must be able to absorb extremes in temperature and weather and continue to serve dependably and accurately.

"It has been my experience that David White instruments are made with standards of precision and ruggedness that far surpass those needed to meet job requirements. The customary annual maintenance keeps them good as new."

The David White Instrument Company has been making highest quality surveying and optical instruments for over 50 years. You can be sure "the sight is right with a David White."

Write today for your free David White surveying instrument catalog. Or see the complete line of David White instruments at your blueprinter, or lumber, building supply or hardware dealer.

DAVID WHITE

INSTRUMENT COMPANY

Dept. B, 2051 N. 19th St., Milwaukee 5, Wis.

SALES AND SERVICE
continued

Hendrickson Mfg. Co.: The company announces the following shifts in top management: Robert T. Hendrickson becomes chairman of the board; Carl R. Hendrickson becomes president; Edward D. Hendrickson becomes executive vice president; George W. Hendrickson was re-elected vice president, research and development; R. Earl Millar was re-elected vice president of manufacturing; and William F. Hendrickson becomes secretary.

Associations

Portland Cement Association: A new regional office has been set up in Denver, Colo. Edward W. Thorson, who has been in charge of the Denver district office since 1946, becomes regional manager. He will supervise district offices in Salt Lake City, Utah, and Helena, Mont., in addition to Denver. Walter C. Oram has been appointed paving engineer of the Rocky Mountain Regional Office.

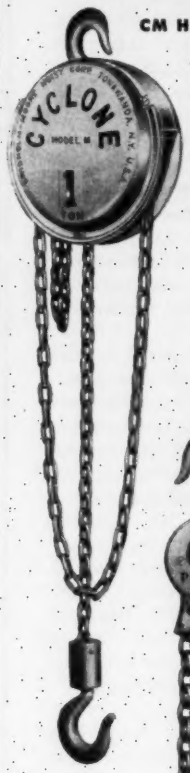
Calcium Chloride Institute: The area of operation for several field engineers have been changed. William J. O'Brien, working out of Philadelphia, Pa., will cover Delaware, Maryland, Pennsylvania, New York and New England. Keith M. Saville, of Peoria, Ill., will cover Indiana, Illinois, Missouri and Iowa. Harry A. Smith in Racine, Wis., will cover Michigan, Minnesota, Wisconsin, and the Chicago district. Henry B. Aikin, in Washington, D. C., will work with federal agencies and will cover the states of Virginia, West Virginia, and North Carolina. Gordon K. Owen, in Lexington, Ky., will cover Kentucky, Ohio, Tennessee, Alabama, and Georgia.

Special Mention

John Ulrich Co.: The John Ulrich Company has been formed to produce auxiliary equipment for Caterpillar machines. John J. Ulrich is president of the new firm and R. D. MacDonald is vice president in charge of engineering and manufacturing. Company offices will be in El Paso, Ill. Products include a base spreader that attaches to a dozer blade and a shoulder spreader for use with Caterpillar graders. Products will be sold and serviced by Caterpillar dealers.

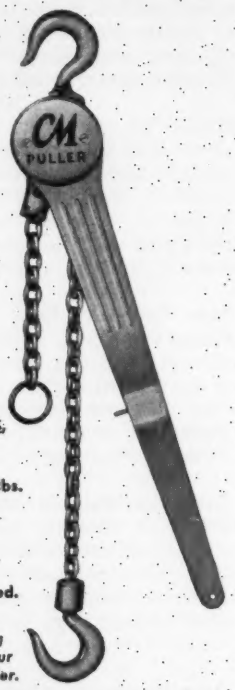
CM HOISTS

...choice of the wise buyer who compares



CM HOISTS AND PULLERS are ruggedly constructed to give you years of trouble-free service. Yet they are unusually light... easy to handle because they are constructed of the strongest alloys of steel and aluminum. Equipped with famous CM-Alloy flexible, welded alloy steel load chain.

CM CYCLONE
- Capacities from ½ to 10 ton.
- 1-ton model weighs only 36 pounds.
- 96% efficient—easy to operate.
- Lifetime lubricated.

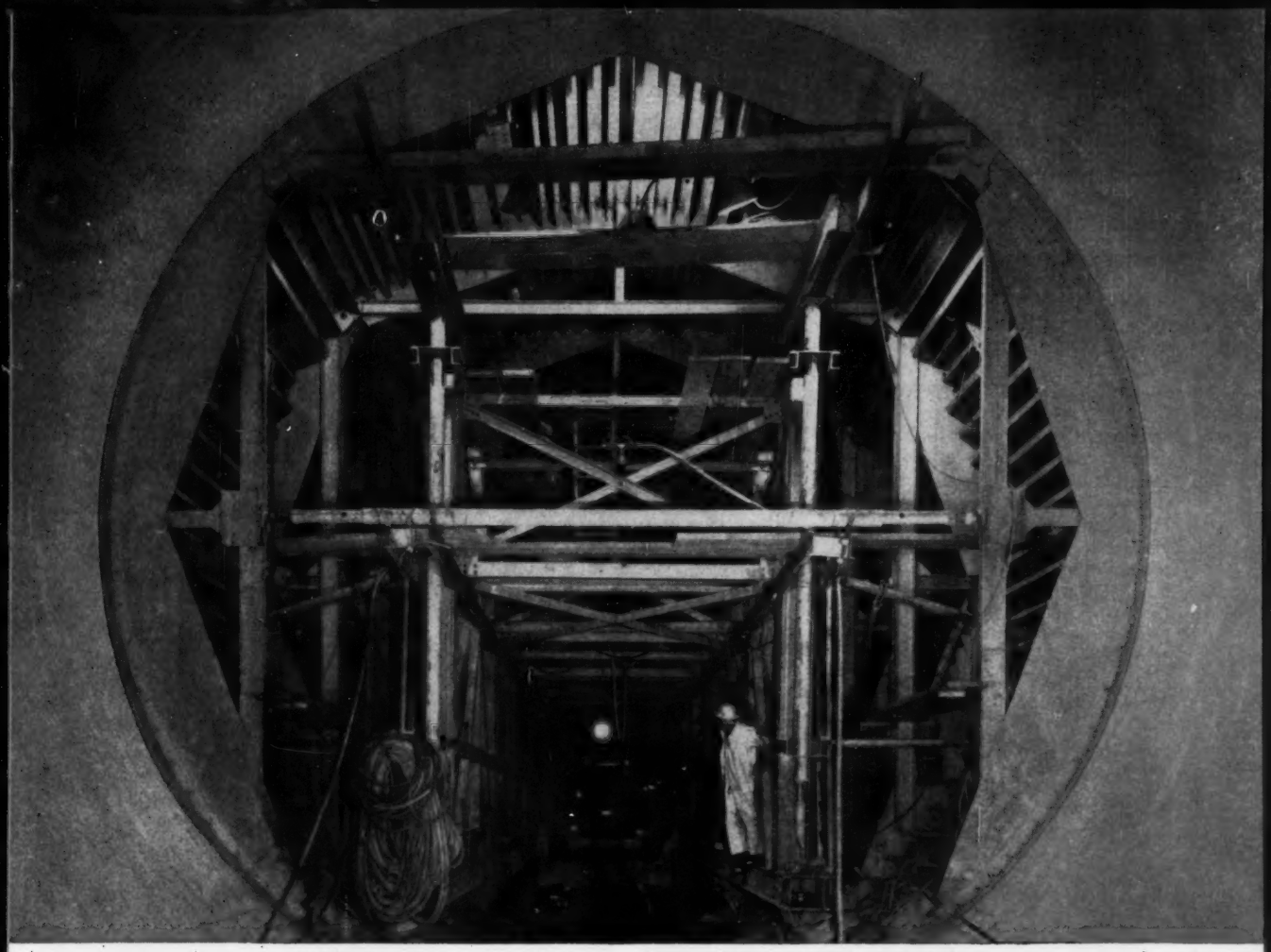


CM PULLER
- Capacities ¾, 1½, 3 and 6 ton.
- ¾-ton model weighs only 13 lbs.
- Compact: stores in tool box.
- Lifts or pulls at any angle.
- Lifetime lubricated.

Write for catalog and name of your nearest CM dealer.

CM

CHISHOLM-MOORE HOIST DIVISION
COLUMBUS McKINNON CHAIN CORPORATION
TONAWANDA, NEW YORK
REGIONAL OFFICES: NEW YORK, CHICAGO, CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ont.



Design of traveler permits vehicular operation through tunnel while form is in place. In addition Blaw-Knox developed and built a concave screed for the tunnel invert.

Concrete Forming time cut by 33% on Trinity Dam Diversion Tunnel

Single Blaw-Knox Tunnel Form moving on rubber-tired traveler is handled by six man crew

More than 30,000 cubic yards of concrete have been poured in the construction of the 2,570 foot long, 28-foot diameter diversion tunnel at the Trinity Dam Project at Lewiston, California. To speed forming operations, Trinity Dam Contractors chose two specially designed Blaw-Knox Tunnel Forms, each 50 feet long, equipped with two rubber-tired travelers each.

The Blaw-Knox Forms can be set, stripped, and reset without disassembling any of its components. Each set of wheels is equipped with a ratchet device to permit steering of the traveler around horizontal curves. Despite its weight, the form is moved by two men operating hand winches. Elevation is controlled by a series of hydraulic jacks, and sidewall adjustments are made with steamboat ratchets. Telescoping pipe spreaders support sidewalls during pouring.

With these specially designed units, Trinity Dam Contractors poured every day, alternating between forms, allowing 16 hours set-up time. Using other methods, a maximum of only two pours a week would be possible. Guy F. Atkinson Company is sponsor of the $49,000,000 joint venture. Other joint venturers are: M. J. Bevanda Co., Inc., Chas L. Harney, Inc., Ostrander Construction Company, A. Teichert & Son, Inc. and Trepte Construction Co.

You can put the know-how of Blaw-Knox Steel Forms Engineers to work on your concreting problems. You'll get the benefit of 40 years experience translated into versatile, rugged equipment designed to help increase your profits. Call on the Blaw-Knox Steel Forms Consultation Service for planning help now. There's no obligation, of course.

BLAW-KNOX

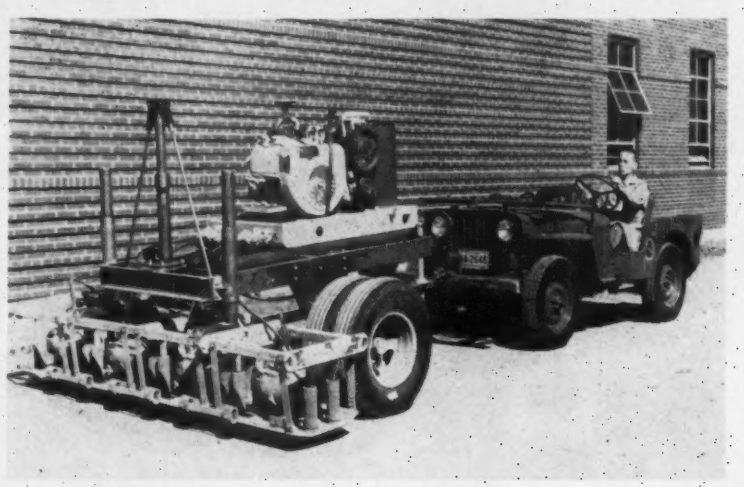
BLAW-KNOX COMPANY

Blaw-Knox Equipment Division · Pittsburgh 38, Pa. · Phone STerling 1-2700

Construction Equipment News . . .

Vibratory Compactor Pushed By Jeep

Jackson has mounted its vibratory pan-type compactors on a trailer that can be pushed or pulled by a jeep, pick-up truck, or any other small prime mover that might be available. Photo shows trailer unit with four compacting bases being pushed by jeep. Trailer also carries gasoline engine-driven 7.5 kva generator. Each compacting base has its own vibratory motor that delivers up to 4,200 three-ton blows per min. Maximum working width is 13¼ ft.—**Jackson Vibrators, Inc., Ludington, Mich.**

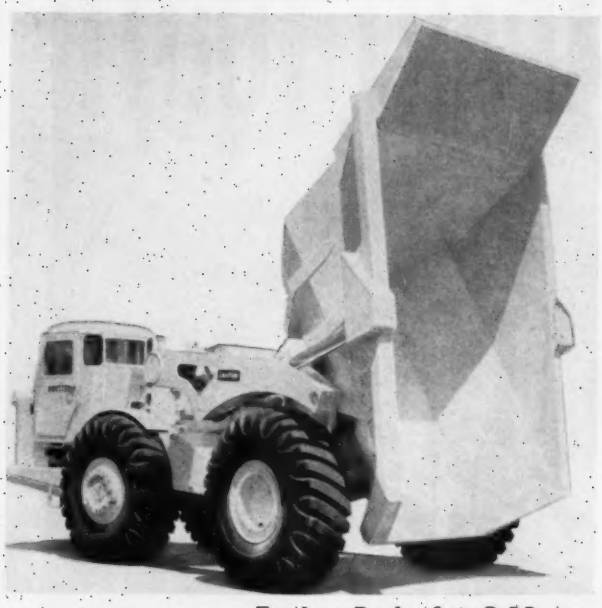


Places Drainage Pipe

The Slidemaster drills low-elevation horizontal or shallow-angled holes—such as those needed for drainage systems to prevent landslides. The diesel-powered drill uses a tungsten carbide bit to reach bedrock, then a rock core is recovered by a diamond bit. A perforated drain pipe is inserted in the drill pipe and stays in place after the drill pipe and bit are removed. The Slidemaster can drill 3⅞-in. holes over 300 ft long. Because it swings through 360 deg, the rig can also be used for conventional drilling.—**Boyles Bros. Drilling Co., Ltd., 1291 Parker St., Vancouver, B.C.**

New Pneumatic Rollers

The newly established Eskridge Equipment Co. has a line of self-propelled pneumatic rollers ranging from 9 to 30-ton models with from 9 to 15 wheels. The 13-wheel, 30-ton unit pictured has a Continental gasoline engine, torque converter, and four-speed transmission. The driver sits on a swivel seat so that he can face backward or forward and steer in either direction. Equipment includes a water sprinkler system, power steering, and cleaning mats on each of the 9.00-20, 10-ply tires.—**Eskridge Equipment Co., 1214 S. Harwood Ave., Tulsa 12, Okla.**



Easton Body for S-12

A short turning radius and controlled dumping are features of Easton's new 22-ton rear dump body. Designed for Euclid's S-12 prime mover, the rig turns in a width equal to its own 28 2/3-ft length. With the body in the dump position, the wheel base shortens 5½ ft and the rig turns in less than 24 ft. A new single-stage, double-acting hydraulic hoist, supplemented by an auxiliary control device, provides smooth and controlled action throughout the dumping cycle. Maximum dumping angle is 60 deg.—**Easton Car & Construction Co., Easton, Pa.**

Lima Adds Truck Crane

A four-axle, 50-ton truck crane has been added to the Lima line. The carrier, built by Lima, is available with 8x4 or 8x6 drive. Features include a T-1 steel frame, removable outrigger boxes, and power steering. Crane features include air controls, enclosed deck gears, power raised and lowered telescope back hitch gantry, and independent planetary boom hoist. Power is supplied by a gasoline or diesel engine with torque converter. Pin-connected booms and jibs up to 180 ft long are available. Counterweight is removable.—**Baldwin-Lima-Hamilton Corp., Lima, Ohio**

Tractor-Drawn Scraper

Clark's first tractor-drawn scraper, the four-wheel Michigan 110, carries 8 yd struck and 10½ yd heaped. When it is teamed with a Michigan 180 tractor or its equivalent, the operator simply moves short-throw levers to operate the hoist, apron, and ejectors hydraulically. Scraper cutting edge is made up of four interchangeable and reversible sections. Tires are wide-base and tubeless. The scraper is 27 ft 7¼ in. long, 8 1/3 ft wide. It weighs 14,450 lb empty.—**Clark Equipment Co., Pipestone Rd., Box 599, Benton Harbor, Mich.**

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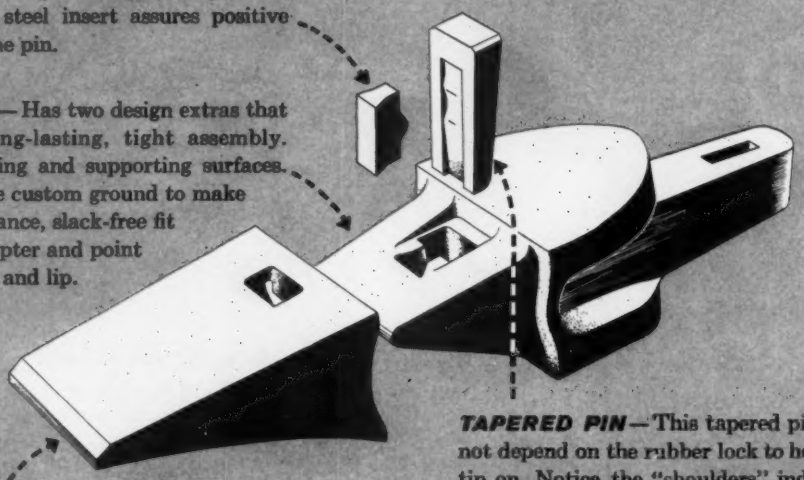
NEW AMSCO® 2 PART TOOTH



PIN LOCK—Special high-strength rubber with a steel insert assures positive locking of the pin.

ADAPTER—Has two design extras that assure a long-lasting, tight assembly. Larger bearing and supporting surfaces. Adapters are custom ground to make a close-tolerance, slack-free fit between adapter and point and adapter and lip.

REVERSIBLE TIP—Enables you to get longer digging life while maintaining sharpness.

TAPERED PIN—This tapered pin does not depend on the rubber lock to hold the tip on. Notice the "shoulders" indicated on the front of the adapter . . . and the mating shoulders on the pin. These shoulders lock the tip in place with metal-to-metal contact. The rubber lock, in turn, locks the pin in place.

3 big features for fewer shovel shutdowns

1 You get up to four times extra wear over other 2-part teeth. We cast these new teeth of a tougher, new and special heat-treated alloy that slashes your replacement and maintenance costs.

2 These reversible teeth stay sharp, to penetrate cleanly and easily without straining your shovel. Reversing point is easy. This reversible feature is particularly important on corner teeth. It maintains digging efficiency throughout tooth life.

3 Positive locking device—Amsco's unique pin-locking design secures tip to adapter in tight, positive, metal-to-metal contact.

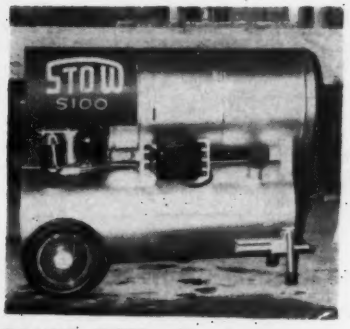
Order the Amsco 2-part Simplex from your local power shovel dealer.

AMERICAN Brake Shoe COMPANY

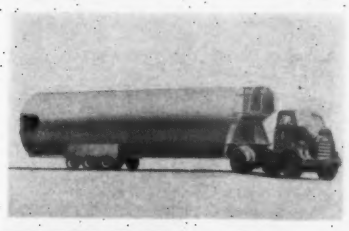
AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC



SAVES FUEL—Stow's new recirculation-type, oil-fired portable space heater features a built-in thermostat similar to the type used in home heating systems. Once the operator sets the temperature on the thermostat dial it automatically turns the unit on and off to maintain constant heat. This saves fuel and allows the heater to run for up to 30% longer on one tank of fuel. This extra capacity allows the heater to be left on overnight. Six models are available, with outputs ranging from 100,000 to 1 million btu per hr. The portable heaters come with automatic electric ignitions. Just plug a heater in and turn it on. They also feature electrically driven fans and enclosed combustion chambers that completely burn fuel to produce more heat with little or no odor or fumes. The heaters also have twin-disc air controls that compensate for variations in fuel types, temperature, or altitude. A cut-off switch that protects working parts is also standard.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**

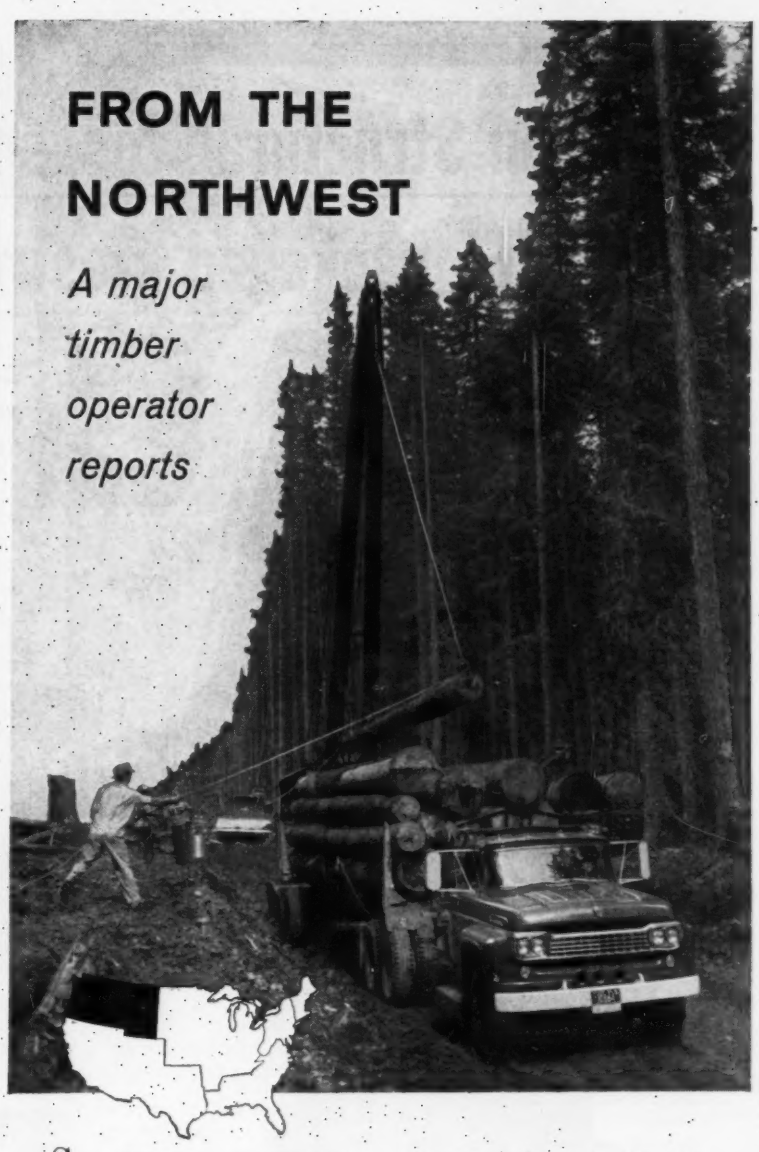


PORTABLE SILO — Engineered Equipment's new portable cement silos—an 8-ft dia 250 bbl model and a 10-ft dia unit with up to 460 bbl capacity—feature bucket elevators that are built inside the silos to conserve space. Both sizes also are available with or without 30 to 50 bbl "up-stairs" storage areas that can be used to charge separate cement batchers.

continued on page 163

FROM THE NORTHWEST

A major timber operator reports



Steve Wilson's company hauls logs from mountainous Oregon timber stands—over crude roads with grades up to 18%.

Mr. Wilson has 43 Ford trucks and tractors that haul nearly 300,000 board feet of logs and rough lumber a day.

"I can't think of a tougher job for a truck than my operation," says Steve Wilson. "I need trucks that can take punishment and *stay* on the job. If a load of logs isn't delivered on schedule, I can lose plenty."

The tractor in the picture is a 1958 Ford T-850.

It is powered by a 534-cubic inch V-8 engine. Rear axle ratio is 6.69 to 1, wheelbase is 192 inches. It is equipped with a 5-speed main transmission and a 4-speed auxiliary, and grosses 72-76,000 pounds.

"Diesels used to walk right around us, but today it's just the opposite. This big Ford climbs a 10% grade loaded at 11 miles an hour, compared to 6 mph for our previous truck."

S. O. Wilson

President
Steve Wilson Company

Carbon Structural, too, specifies HELTZEL packaged prestress plant

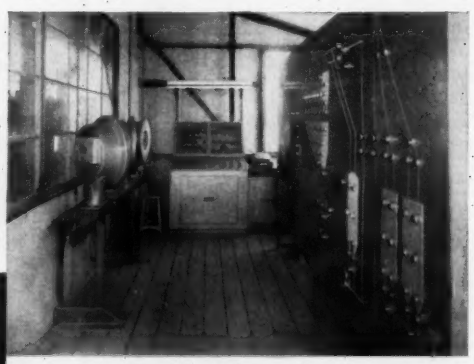
Heltzel Type 200 Combination Batching Plant designed for Carbon Structural for prestress and/or product batching to specification.

Coded controls, turbine mixer design, features of new specification plant

Fast, fully automatic, versatile . . . reasons why so many leading prestress concrete product manufacturers are specifying Heltzel Packaged Prestress Batching Plants.

Carbon Structural Concrete of Youngstown, Ohio, recently set into operation the first specification prestress plant designed to incorporate the new turbine type mixer. It is a fully automatic plant with a central control requiring but a single operator. Material handling controls are coded to pin-point each operation as it occurs. A Clary printer scans and prints three scale weights on a single tape and identifies each batch. Aggregate and cement loading are push button automatic. All weighing and metering equipment meets or exceeds Corps of Engineers specifications.

If you are considering batching equipment for prestress, highway construction or ready mix, make sure you have the last word on the finest plants designed today—Heltzel Automatics.

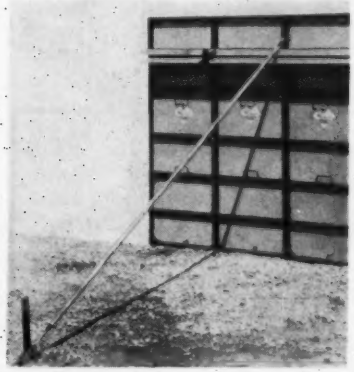


Central control area. All operations, including loading, are fully push button automatic.

THE HELTZEL STEEL FORM & IRON CO. • WARREN, OHIO

Manual or automatic scales are optional. The silos are mounted on tandem pneumatic-tired towing wheels, with a fifth wheel for attaching the units to truck trailers. Electric brakes are optional. **—Engineered Equipment, Inc., Waterloo, Iowa.**

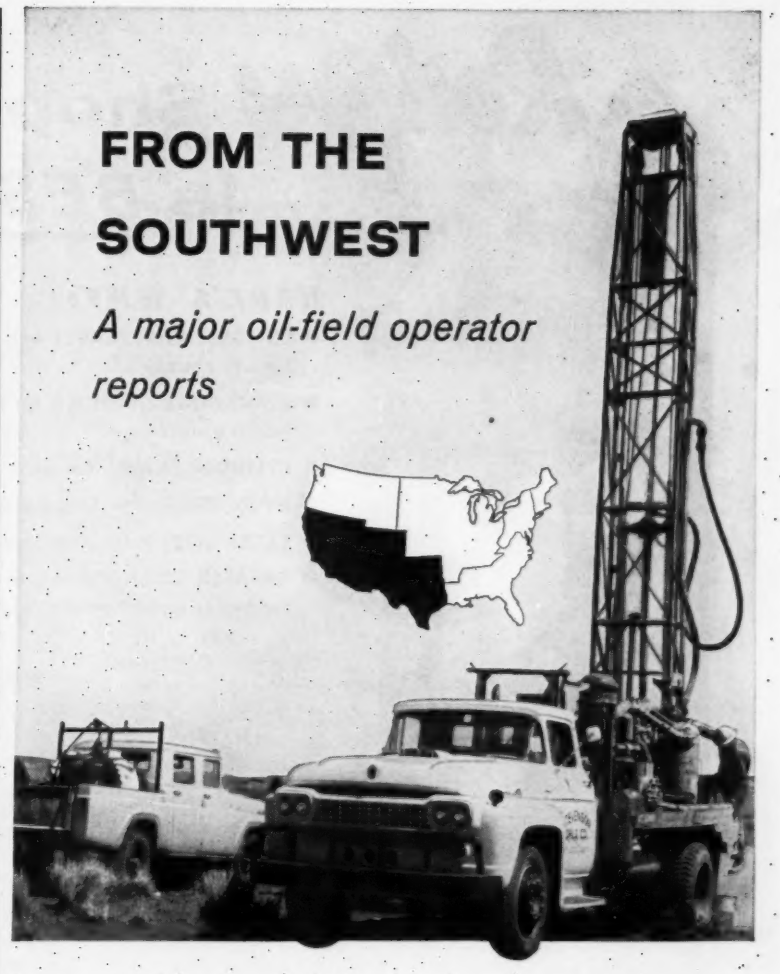
GOES UP EASILY—The Kemhut, a 10-ft wide, 12-ft long, 7-ft high job shack made of fiber glass panels, is designed for use as a construction job office, tool crib, or small equipment storage hut. The Kemhut comes in a ready-to-assemble 7x4x6-ft package that includes pre-cut panels, ventilating louver, hinged door, aluminum angles, and fastenings and other hardware. It weighs only 150 lb. It can be dismantled easily or moved by a flat-bed truck to a new site. Made of shatterproof fiber glass panels that become even stronger when curved, the Kemhut does not need any internal bracing. The rotproof, weather-resistant panels are secured with rust-proof fastenings and water-tight washers. **—Kemlite Corp., 101 N. Republic Ave., Joliet, Ill.**



ADJUSTABLE BRACE—A steel form brace that can be adjusted by a man atop the form or by the crew on the ground has been added to the Symons line of pre-

FROM THE SOUTHWEST

A major oil-field operator reports



This '58 Ford F-850 runs all day . . . but hardly moves at all.

It belongs to the Stevenson Drilling Company of Houston, Texas. The truck goes only a few miles a day but its V-8 engine runs all day long—powering (transmission PTO) a drill that's searching for oil. The combination air-water drill makes 100-ft. deep "shot holes." The oil company geophysicists detonate dynamite in these holes for seismograph recordings that reveal the location of new oil deposits.

"We are really impressed with the way these new Ford Super Duty V-8's are engineered," says W. M. Stevenson. "We normally drill on propane, through a truck's carburetor throat, but the fuel costs of our Super Duty V-8 turned out to be so reasonable that we didn't need to switch."

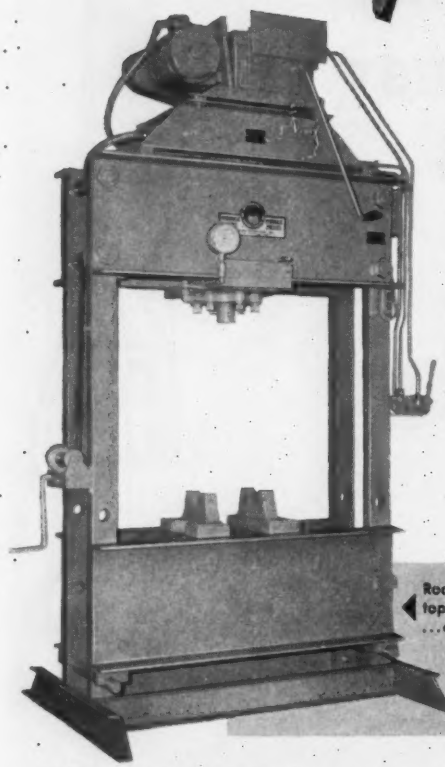
The Super Duty V-8 power plant in the Stevenson Company's F-850 displaces 401 cubic inches. It has a 5-speed transmission and a two-speed rear axle ratio of 6.50/8.87 to 1. Wheelbase is 175 inches, gross weight 23,000 lb.

"We have used Fords since 1946. We like the availability of Ford replacement parts, their low cost and the excellent Ford service. I plan on buying Ford trucks 100% in the future."

W. M. Stevenson

President
Stevenson Drilling Company

A *Rodgers* Shop Press is *BEST for YOU!*

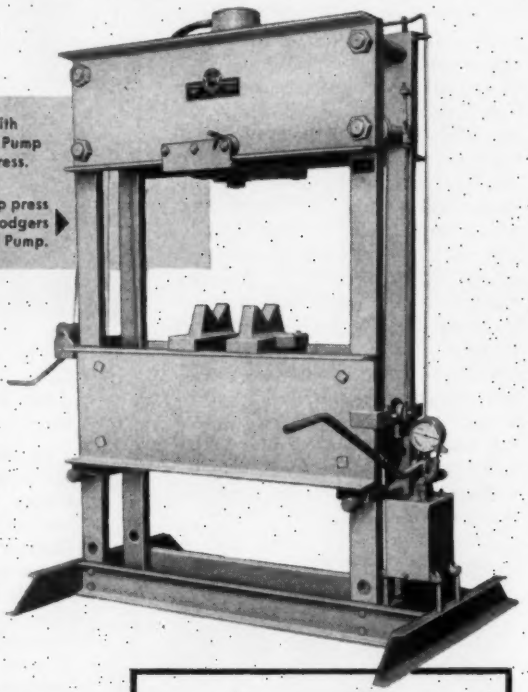


Rodgers 100 ton shop press with top mounted Greenlee Power Pump ... cylinder travels width of press.

Rodgers 100 ton shop press with Rodgers 2 speed Hand Pump.

HERE'S WHY:

- **LONGEST RAM TRAVEL** with maximum hydraulic power throughout entire stroke.
- **REMOVABLE CYLINDER** for independent hydraulic power away from the press.
- **CYLINDER TRAVEL** full width of press, either way.
- **OPEN ENDS** allow long pieces to extend through sides of press.
- **EXTRA WIDE** inside work space to handle bigger jobs more easily.
- **GREATER STRENGTH** with heavy bar stock sides and pins—bearing blocks support bolster to give uniform distribution of pressure.



WHEN YOU INVEST in a shop press it is more important to compare performance than initial cost!

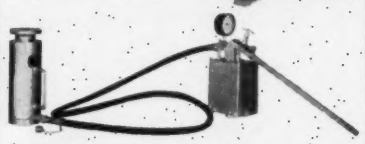
Rodgers Shop Presses are designed and built for the most versatile service, and longest trouble-free life. In the shop they handle hundreds of diversified jobs ... pressing, bending, straightening, assembling. For field work the Rodgers cylinder and pump are easily removed from the press, making an ideal portable power unit for jacking, lifting, heavy shaft removal and similar work.

Rodgers produces the most complete line of shop presses available—capacities from 60 to 400 tons—in varied standard models with power pumps, top mounted or placed at the side—or hand pumps with 2 or 3 speeds.

When you compare shop press performance and cost you will find a Rodgers is best for you, too. Ask your Rodgers Representative for complete details—or write us.

SEND FOR NEW CATALOG ...

It gives useful information and complete specifications.



Rodgers Cylinder and Pump are easily removed from shop press (such as above) for off-press jobs.

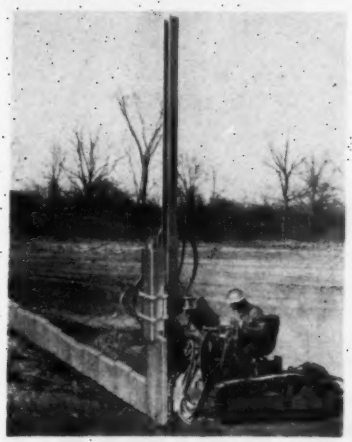
HYDRAULICS Rodgers KEEP THE WORLD MOVING

RODGERS HYDRAULIC, Inc.

Pioneers In High Pressure Hydraulics Since 1932

7403 WALKER STREET · MINNEAPOLIS 26, MINNESOTA

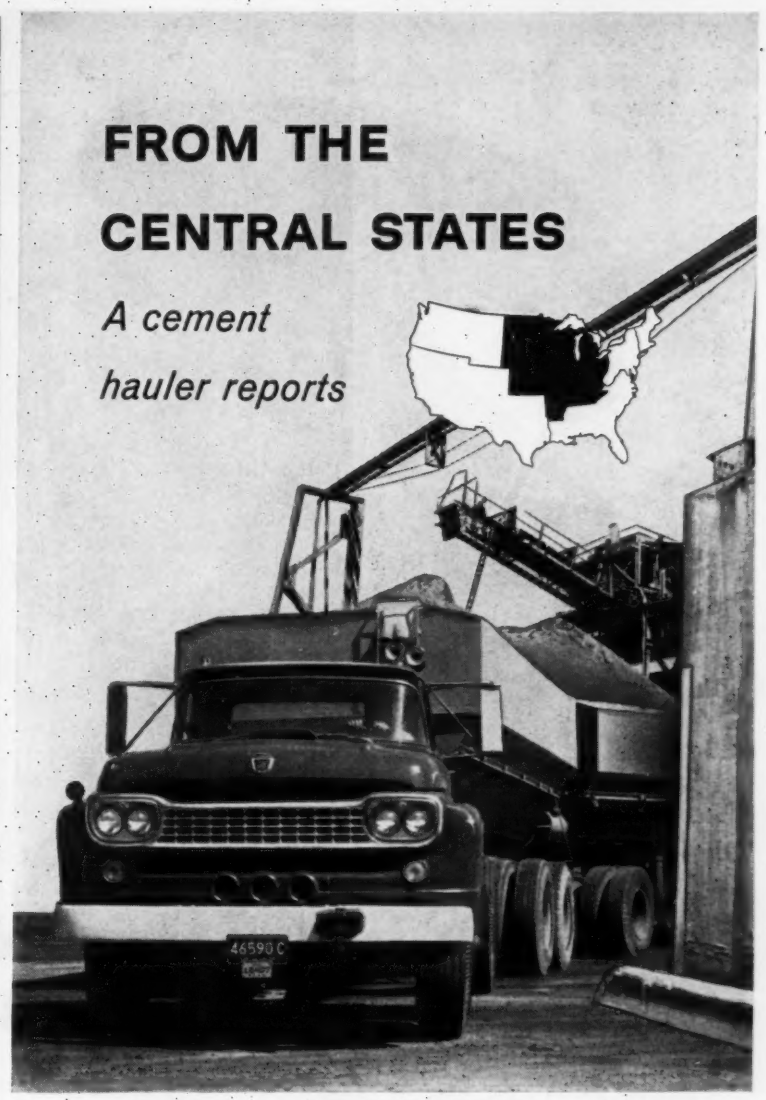
fabricated concrete forms and hardware. The steel brace, which can be used over and over again, comes in regular lengths of 6 and 10½ ft or on special order in 15 or 19½-ft lengths. Brace extensions in standard lengths of 4½ and 9 ft also are available. Extensions are attached to the main brace with a simple wrench adjustment. The 1-5/16-in. dia carbon steel brace can be used with Symons forms and hardware or with built-up forms employing steel on wooden stakes.—**Symons Clamp & Mfg. Co., 4249 W. Diversey Ave., Chicago 39, Ill.**



VERSATILE—A new Trac-Hammer that can be used to break concrete, drive piles, or drill has been developed by Vulcan and Gardner-Denver. The unit is a Vulcan portable pile hammer mounted on Gardner-Denver's Air Trac drilling rig. The hammer and the drill are interchangeable on the crawler-mounted drill mast. The unit is designed to work in areas that are normally inaccessible to most other types of mobile equipment. The Air-Trac drilling rig, which can tow its own compressed air supply, has an all-angle boom that enables it to drive piles or drill holes from virtually any position. The automatic hammer unit has only four moving parts. It is connected to the drill mast by a special mounting bracket. No mast modification is required. The hammer features a rocker-type valve that is held against its seat by air pressure to prevent air leakage as wear occurs. The hammer, which requires 60 psi, is capable of delivering 303 blows per min with a striking weight of

FROM THE CENTRAL STATES

A cement hauler reports



Carl Harrison, Inc., is a limited common carrier of bulk cement operating out of Dearborn, Michigan. The Ford F-1100 shown above is the biggest of the firm's six Ford trucks.

This F-1100 grosses 98-100,000 lb. pulling doubles. Payload is 64,000 lb. (170 barrels of cement). Company President Carl Harrison makes the point that the low curb weight of Ford trucks allows him to carry bigger payloads. "The curb weight of this Ford tractor is almost half a ton less than another make we have used on this job."

Carl Harrison's shrewd appreciation of efficient, economical equipment is further evidenced by the fact that his bulk cement semi-trailers are custom-built to his own design.

Additional specifications of this F-1100: 534-cu. in. Super Duty V-8, 5-speed transmission, 2-speed rear axle, 144-in. wheelbase.

"And as far as power is concerned, this big Ford has really got it. She saves time on every trip, time that means money to us."

Carl Harrison

President
Carl Harrison, Inc.

Bethlehem Rock Bolts are easy to install. Here slotted bolt, with wedge started in slot, is inserted in hole.

Rock bolts promote safety by stabilizing slopes

When bolt is driven with percussion tool, wedge is driven deep into slot, spreading bolt ends. Nut is then tightened with impact wrench.

Bethlehem Rock Bolts greatly reduce the chances of severe rock slides by locking together the stratified rock slabs, so that slopes are effectively stabilized.

TWO TYPES OF BOLTS The Bethlehem Slotted Rock Bolt, shown in the accompanying pictures, is inserted wedge-first in a drilled hole. The steel wedge, already started in the forged, centered slot, spreads the bolt ends when forced against back of hole. In addition to the 1-in. diam slotted bolt, Bethlehem also makes $\frac{5}{8}$-in. and $\frac{3}{4}$-in. diam Headed Rock Bolts, used with an expansion shell. Either bolt can be furnished in various lengths.

ROCK STRATA LOCKED TOGETHER Bethlehem Rock Bolts can be used with steel ties, anchor plate washers, or angle washers. Properly installed, the bolts provide a practical and economical means of locking stratified rock slabs together.

If you want to stabilize a troublesome rock formation, be sure to get in touch with us. All you need do is contact the nearest Bethlehem sales office.

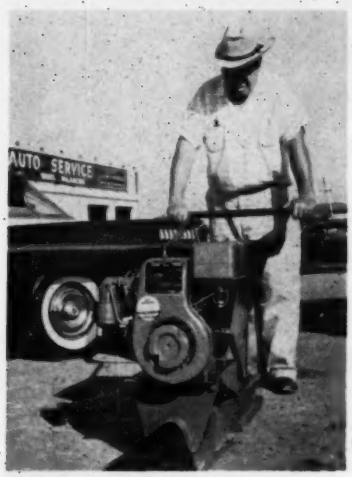
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM STEEL

100 lb. The hammer weighs 786 lb with the striking plate. The drill rig is powered by two five-cylinder radial air motors through a double chain drive.—**Gardner-Denver Co., Quincy, Ill., or Vulcan Iron Works, Chicago, Ill.**



WON'T CLOG—A new principle of material delivery that provides up to 6,000 lb of extrusion force eliminates clogging of the new Bmco curbing machine, according to the manufacturer. The machine lays up to 150 ft of 6-in. asphalt curb an hr, without sand packing. Three standard forms can be interchanged easily. The machine is self-propelled. Power is supplied by an air-cooled Wisconsin engine.—**Browning Mfg. Co., San Antonio, Texas.**

GERMAN ENGINES—Hercules has acquired sole American distribution rights to the German-built Jlo (pronounced Eelo) line of small air-cooled diesel and gasoline engines. The Jlo series of

FROM NEW ENGLAND

A nationally operated dairy reports

"Milk and dairy products make highly concentrated loads," says Elnathan Mitchell, President of Mitchell Dairy. "We need a bigger, stronger tractor than usual for our gross of about 50,000 lb. We decided to try a new Ford Tilt."

Mitchell Dairy, an affiliate of The Borden Company, has headquarters in Bridgeport and serves almost the entire state of Connecticut. The dairy's Ford C-1000 Tilt is on the job seven days a week, hauling canned and bottled milk from Bridgeport to outlying distribution plants.

This big Ford operates both in heavy city traffic and on expressways. Comments of drivers: "She makes it really easy to handle trailers in tight areas". . . "There's practically no shifting once she gets up to cruising speed". . . "Outpulls any tractor in the fleet."

Mitchell's Ford C-1000 Tilt Cab tractor has a 477-cu. in. V-8, five-speed transmission, 6.71/9.13 to 1 two-speed rear axle ratio, 99-inch wheelbase.

"We bought this Ford Tilt Cab truck chiefly because of its maneuverability and its low curb weight—over 1,000 lb. lighter than competitive tractors. That means our legal payload can go better than 30,000 lb."

Elnathan Mitchell

President
The Mitchell Dairy Company

"Hothouse" of VISQUEEN Trade Mark film makes Bridge grow fast in freezing cold, high winds

PROBLEM

Local ground contours threatened washout of the bypass. Freezing, mid-January cold swept in from Lake Michigan over the project site. Severe February storms were to come.

SOLUTION

Contractor L. G. Arnold, Inc., Eau Claire, Wisconsin, beat the weather, sped pouring of footings and piers, as well as curing of slabs for the two-lane bridge, with a heat-retaining enclosure of VISQUEEN film which framed the entire substructure form work.

Though outside temperatures ranged from freezing to sub-freezing, workmen operated at maximum efficiency and productivity in the comfort of the 20 to 30 degrees higher temperatures inside the VISQUEEN film enclosure.

The VISQUEEN film admitted adequate natural light. High wind velocities failed to tear the strong, light VISQUEEN film.

VISQUEEN film is specially formulated and manufactured for construction applications. *Seamless* widths through 32 feet, and the superior uniformity of thickness, make VISQUEEN film stronger, yet more economical than any other polyethylene for construction enclosures and concrete curing. Low first cost—and the superior quality that permits many re-uses, cuts costs.

WRITE NOW TO THE PIONEER MANUFACTURER OF CONSTRUCTION POLYETHYLENE OR USE THE INFORMATION REQUEST TAG BELOW.

information request tag
VisQueen
Trade Mark
clip this tag. #CM10
attach to letterhead, mail.

VISQUEEN *film—first and foremost polyethylene film. A product of the long experience and outstanding research of*
PLASTICS DIVISION
VISKING COMPANY *Division of* UNION CARBIDE *Corporation*
6733 West 65th Street, Chicago 38, Ill.
In Canada: VISKING COMPANY DIVISION OF UNION CARBIDE CANADA LIMITED, Lindsay, Ontario.

VISQUEEN, VISKING and UNION CARBIDE are registered trademarks of Union Carbide Corporation.

gasoline engines range from 1 to 33 hp and the two diesel models are rated at 7-hp at 2,500 rpm and 12 hp at 2,000 rpm. The one cylinder German diesels feature cast aluminum cylinder blocks, crankcases and pistons. Their weight - per - brake - horsepower ratio is less than 16 lb per horsepower. The engines weigh 110 and 190 lb. A feature of the diesel units is a Lanova combustion system that increases engine efficiency by producing a flow of burning gases that are directed into the fuel spray to insure optimum fuel and air mixture. An axial blower assures proper cooling.—**Hercules Motors Corp., 101 11th St., S.E., Canton 1, Ohio.**

COMPACT FILTER—The new Roosa Master diesel fuel filter is a compact unit that offers 560 sq in. of filtering area. Consisting of just three main parts—the top, element, and base—the filter uses a new spiral paper construction that gives a large filtering surface area in a small package. Paper strips are cemented together at top and bottom to form a series of V-shaped coils that are wound around a cylindrical core. When the element becomes clogged it is replaced easily without tools. To change the element the top is unscrewed by hand and the element is removed from the base without disconnecting fuel lines. As the element is removed, a spring-loaded seal blocks off the passage leading to the injection pump to prevent dirt from entering the line and fuel from leaking. It is

FROM THE MIDDLE ATLANTIC STATES

A dump truck operator reports

"I operate all over New York State," says owner-operator Wendell Wilbur, "and loaded or empty my Ford can beat any dump on the job."

Mr. Wilbur's big 1958 Ford T-850 has a 10-cu. yd. dump body, is powered by a 477-cubic inch V-8, grosses 50,000 lb. It is equipped with 5-speed main transmission, 3-speed auxiliary, and has a 156-inch wheelbase.

"I'm in this truck all day long," says Mr. Wilbur, "and it's the smoothest riding ten-wheeler I've ever driven. And talk about handling!—with power steering my rig handles easier than a lot of pickups.

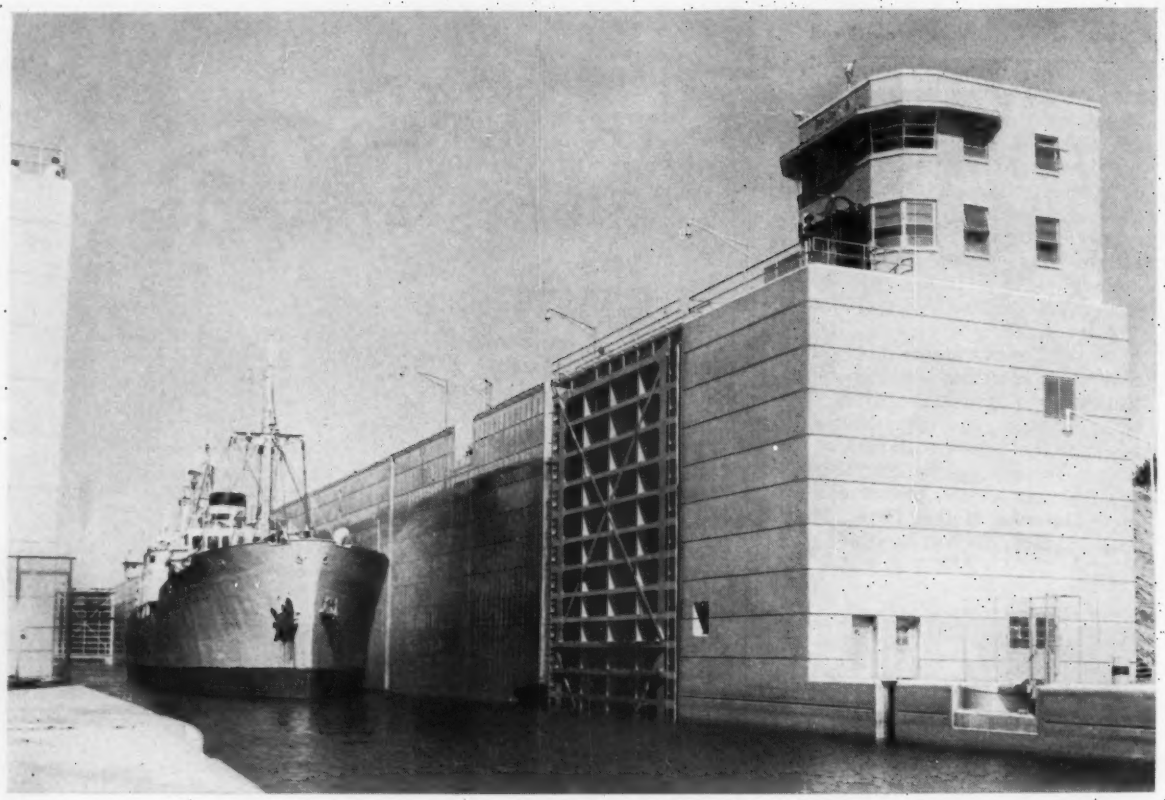
"This Ford's curb weight is almost 4,000 pounds less than other comparable trucks. That means more money-making payload for me."

Mr. Wilbur has been a truck user for more than twenty-five years, and he's been a Ford user just as long.

"My Ford T-850 has real power—on the hills I can pull away from any truck around—I even leave big diesels behind."

Wendell Wilbur

Owner-Operator
Ellenville, N.Y.



Dwight D. Eisenhower Lock, 800 ft. long and with concrete walls 100 ft. high, is one of the Seaway projects in which Lehigh Cements were used. Supervising Engrs.; U.S. Army Corps of Engrs. General Contractor: Morrison-Knudsen, Walsh, Perini.

LEHIGH CEMENTS CONTRIBUTE TO ST. LAWRENCE SEAWAY AND POWER PROJECT

Opening the heart of a continent to ocean commerce and providing vast new sources of electrical power, the St. Lawrence Seaway & Power Project takes its place as one of the great engineering and construction feats of our time.

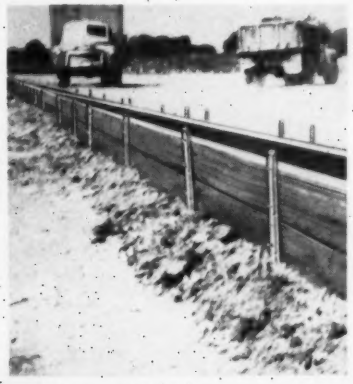
We are proud of the part Lehigh Cements played in this project . . . proud that we are sharing in the building of a better, more productive nation.

- **Lehigh Portland Cement**
- **Lehigh Early Strength Cement**
- **Lehigh Mortar Cement**
- **Lehigh Air-Entraining Cement**

3300 ft. long St. Lawrence Power Dam is world's second largest, producing 2.2 million H.P. of hydroelectric power. Masonry walls of this 10-story powerhouse, at American end of Dam, are laid up with Lehigh Mortar Cement. Consulting Engrs.: Uhl, Hall & Rich. General Contractor, U.S. Half: Perini, Walsh, Morrison-Knudsen, Kiewit, Utah.

LEHIGH PORTLAND CEMENT COMPANY
Allentown, Pa.

impossible to run the engine with the element removed or incorrectly re-assembled. The filter top contains an air vent screw and directions for venting, draining, and changing the element.—**Hartford Machine Screw Co., Hartford 2, Conn.**



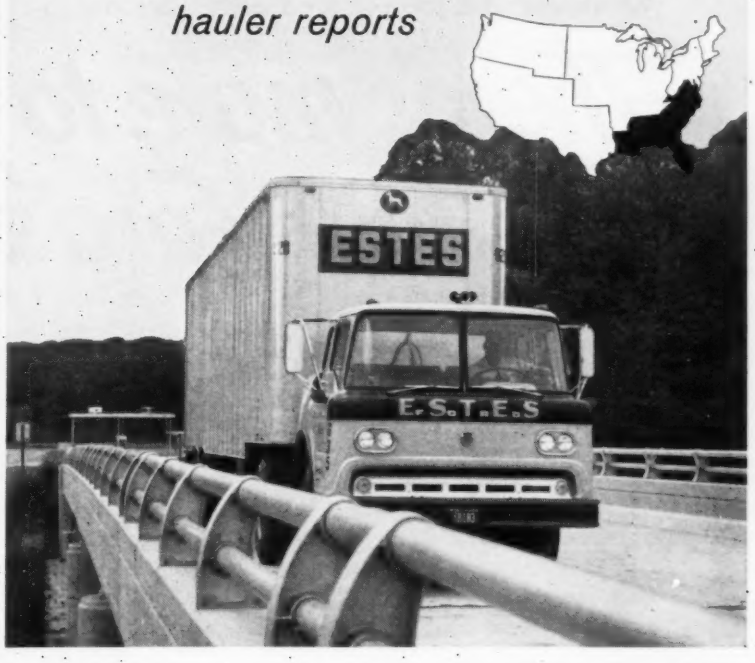
STEEL STAKES—Dee steel construction stakes have 12 nail holes drilled in a spiral arrangement. This provides up to 24 nail entry points so that the stake can be nailed solidly to form board even if it should rotate while being driven into the ground. Another advantage is that the stake holes serve to support the nail as it is being driven, leaving both hands free for final adjustments and nailing. The stakes are made of cold drawn solid steel. It takes only one or two nails to secure them to the form. Stripping is easy—just remove the nails, tap the stake, and pull it out. Dee stakes are available in stock lengths of 12, 18, 24, 30, 36, and 42 in. and in ¾ and ⅞ in. dia.—**Dee Concrete Products Co., 670 N. Michigan Ave., Chicago 11, Ill.**

LIGHTWEIGHT ENGINE—Detroit Diesel's new 210-hp truck engine makes extensive use of aluminum alloys in the cylinders, block and other components to keep down weight. The engine, which weighs only 1,710 lb, is the latest addition to Detroit Diesel's 71-E truck line. Its design includes the recently introduced four-valve head and new fuel injectors and pistons. The engine develops its peak horsepower at 2,100 rpm, and hits maximum torque of 577 ft lb at 1,200 rpm.—**Detroit Diesel Engine Div., General Motors Corp., Detroit 28, Mich.**

continued on page 174

FROM THE SOUTHEAST

An over-the-road hauler reports



Estes Express Lines, of Richmond, Va., owns a 1958 Ford C-1000 Extra Heavy Duty Tilt Cab model. This rig is on the job 20 hours a day, piling up ten thousand miles a month.

Robey W. Estes, Vice President and General Manager, calls the performance he's getting from his new Ford Tilt "outstanding."

"The economy of Ford's 477-cubic inch V-8 compares very well with the 450-cubic inch sixes in our fleet," he adds. "The Ford performs better and doesn't use any more gas. We get over 5 miles per gallon, which is pretty good for our gross and our kind of hauling. The Ford also has a lot more power and speed. As one of the drivers told me—that Ford gets down the road mighty easy."

Estes Express's big Ford is a 1958 C-1000 tractor, with a 477-cubic inch V-8 engine. It has a 99-inch wheelbase, a five-speed transmission and a two-speed rear axle ratio of 6.14/8.36 to 1. Gross weight runs from 52 to 56,800 lb.

"Ford's Tilt Cab design gives us as much as 1800 pounds more payload than we could get with a conventional tractor. Drivers prefer the Tilt because of its comfort and maneuverability."

Robey W Estes

Vice President and General Manager
Estes Express Lines

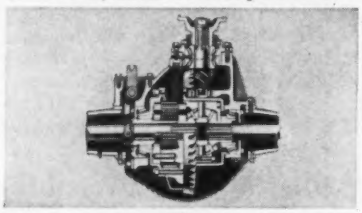
Whatever the job . . . wherever you do it!

There's more to look for in Ford's extra heavies for '59

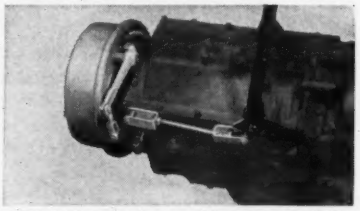
Ford Extra Heavies have proved themselves on every kind of job—you can count on them for *dependability* and *durability*. And in '59, you get high performance at low Ford prices for brand-new reasons! New faster rear axle ratios, new higher capacity axles, and other important options make big-truck operation still thriftier in '59 when you go *Ford*-ward. Send coupon for full information!

NEW Tractor Equipment Package provides complete trailer air brake and electrical connections, meets I.C.C. requirements.

NEW Ford Tilt Cab Tandems are available with three tandem-axle capacities: 28, 34, and 38,000 lb. Front axles to 15,000 lb.



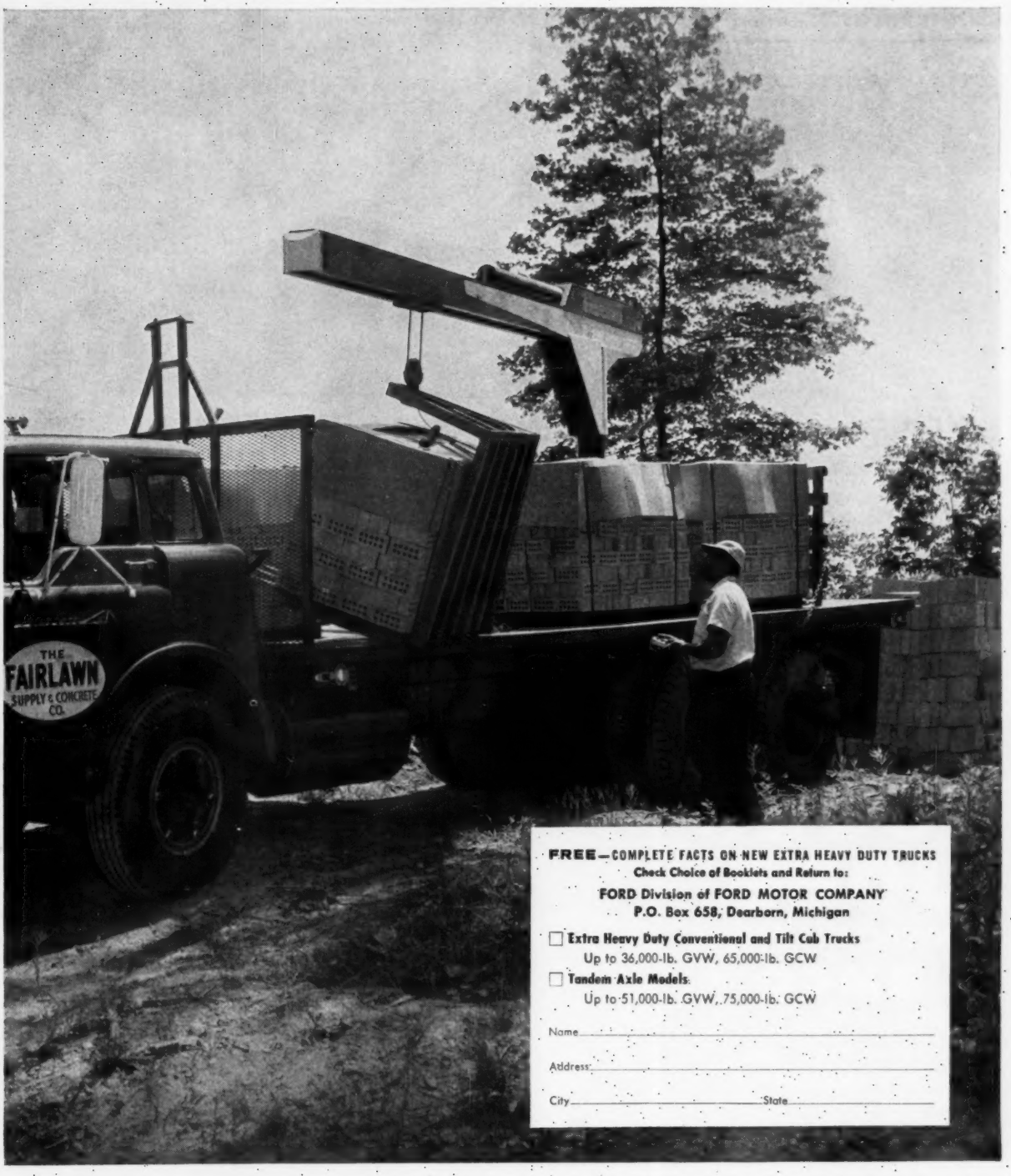
NEW Faster Axle Ratios team up with Super Duty V-8's for greater gas economy and reduced engine wear. For example, 5.43/7.39 to 1 available in 1100 Series.



NEW 2-Shoe Brake (parking) is standard for '59 on all Ford Extra Heavies. Has 50% greater stopping and holding power, requires 50% less effort to operate.

Tilt Cab Tandem Ford C-950 (above) has hydraulic loader with push-button remote control.

Go FORD-WARD for savings FORD TRUCKS



FREE—COMPLETE FACTS ON NEW EXTRA HEAVY DUTY TRUCKS
Check Choice of Booklets and Return to:
FORD Division of FORD MOTOR COMPANY
P.O. Box 658, Dearborn, Michigan

☐ **Extra Heavy Duty Conventional and Tilt Cab Trucks**
Up to 36,000-lb. GVW, 65,000-lb. GCW

☐ **Tandem Axle Models**
Up to 51,000-lb. GVW, 75,000-lb. GCW

Name _____

Address _____

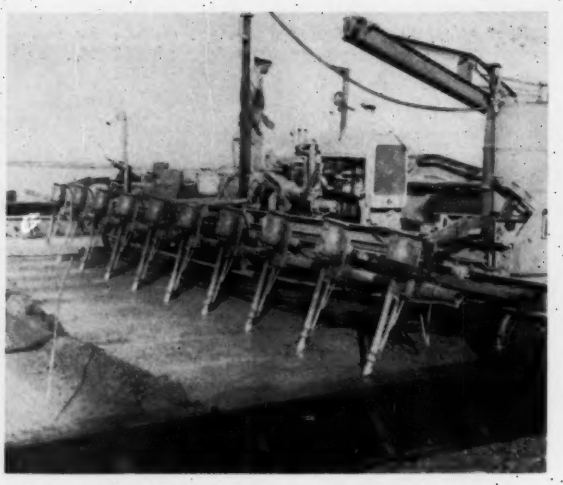
City _____ State _____

BRAND-NEW TILT CAB TANDEM FORDS for '59 combine the easier, more economical maintenance of tilts with high tandem-axle load capacities. Tilt design also permits higher front axle loads, longer body on given wheelbase. C-950 Tandem, above, operated by Fairlawn Supply and Concrete, Akron, has 15,000-lb. front axle, 34,000-lb. rear. Carries up to 6,500 brick, compared to 5,000 on a conventional tandem. Has 401-cu. in. V-8, 5-spd. main transmission, 3-spd. auxiliary, 201-in. wb. GCW (with pup trailer) 72,000 lb.

COST LESS ... *less to own ... less to run ... last longer, too!*

Truck Cab Carries Whole Work Crew

Cabs that carry up to five men in addition to the driver are now available for several medium and heavy-duty International truck models. Previously, International had introduced a similar cab for pick-ups and other light-duty models. Called the Travel-Crew, the cab is designed to transport a full work crew as well as equipment and materials. The cab increases bumper-to-back-of-cab dimensions by only 36 in.—**International Harvester Co., 180 N. Michigan Ave., Chicago, Ill.**



Gang Vibrators Ride on Spreader

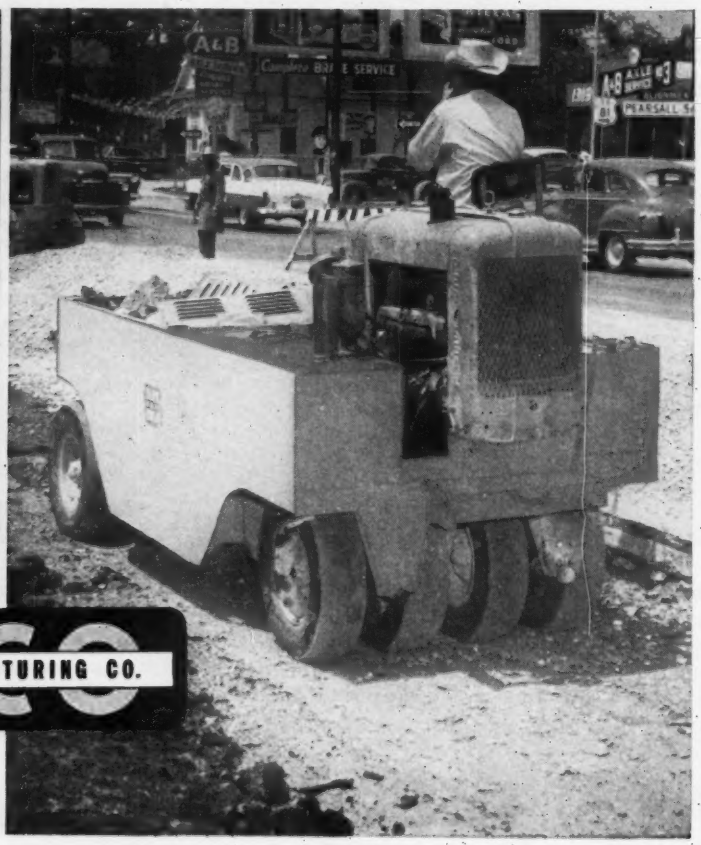
Stow's gang vibrator assembly meets specs that call for full-depth internal vibration for runways and other concrete slabs. The assembly consists of a generator, hydraulically lifted mounting frame, brackets, and 2-hp electric vibrators. The gang rig attaches to a concrete spreader. Combinations of vibrators and mounting frames are available for slabs from 12½ to 25-ft wide.—**Stow Mfg. Co., 31 Shear St., Binghamton, N.Y.**

continued on page 179

FOR THE
TOUGH
JOBS
CONTRACTORS PREFER
BMCO

Job: Widening U.S. 81
Location: Bexar County, Texas
Contractor: Killian-House Co.

BMCO was called upon for the extremely tough job of widening U.S. 81, the greatest traffic street in San Antonio, without stopping the flow of traffic.



BMCO
BROWNING MANUFACTURING CO.

111 HUMBLE AVE. • P. O. BOX 2707
WAlnut 3-4331 • SAN ANTONIO, TEXAS

EXPRESS PAVER resurfacing 15 miles of U. S. Highway 70 south of Huntington, Tennessee. Warren Brothers also used Blaw-Knox Wideners on their portion of the $1,200,000 contract. Express Paver is laying upwards of 1,000 tons per day in a 1½ inch layer. Job Superintendent Bragg is shown at left and General Superintendent Duckworth at right.

"We're 50% ahead of schedule because of the speed of this Blaw-Knox Express Paver"

"Despite the difficulty of this particular mix, our Blaw-Knox unit is laying up to 142½ tons per hour. Although we've had weeks of bad weather, we're 50% ahead of schedule on the maximum 250-day contract time," says R. F. Bragg, Job Superintendent on the Warren Brothers project.

"The quality of roadway is superior to that layed by crawler-mounted equipment. And the Blaw-Knox longer wheelbase reduces waves in the pavement that are sometimes felt when driving over asphalt roads laid by shorter wheelbase pavers. Rubber tires make it possible for us to work faster in completing the major moves that the machine makes, and it paves up to 20% more in the same amount of time," adds Ray Duckworth, General Superintendent.

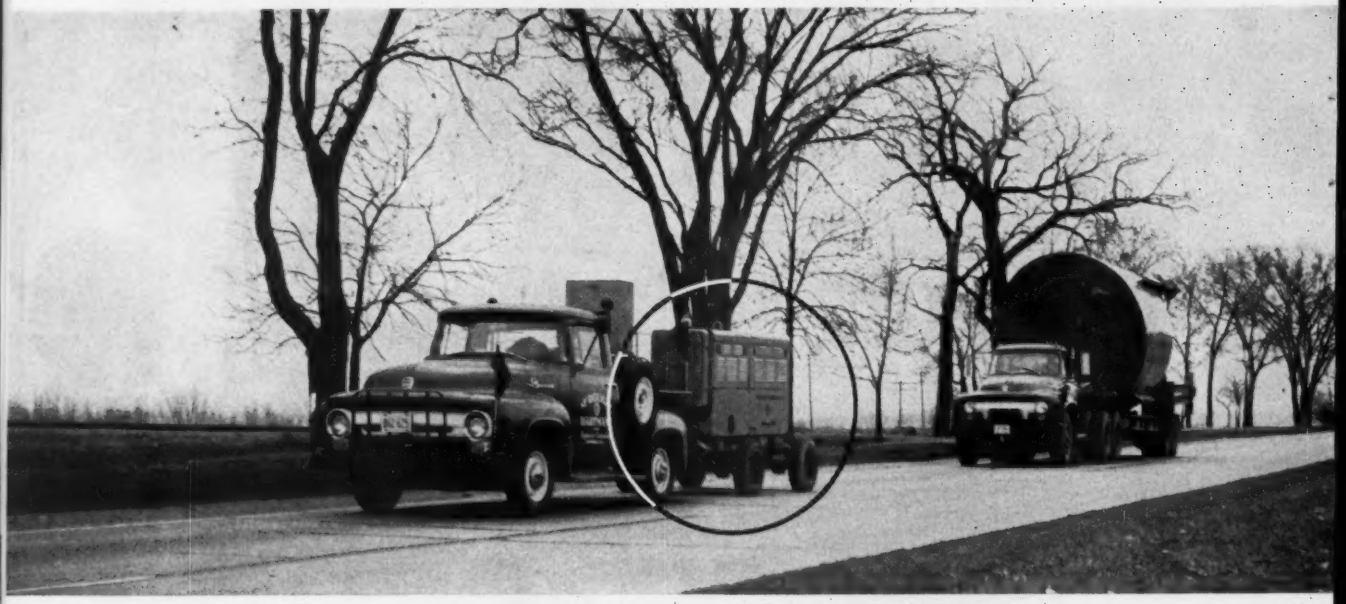
Here is another instance of proved advantages—faster, better quality paving with freedom of movement—that contractors everywhere are experiencing with the new Blaw-Knox Express Paver. See your nearest Blaw-Knox Distributor for a technical report on this project, or write direct. There's no obligation, of course.

BLAW-KNOX

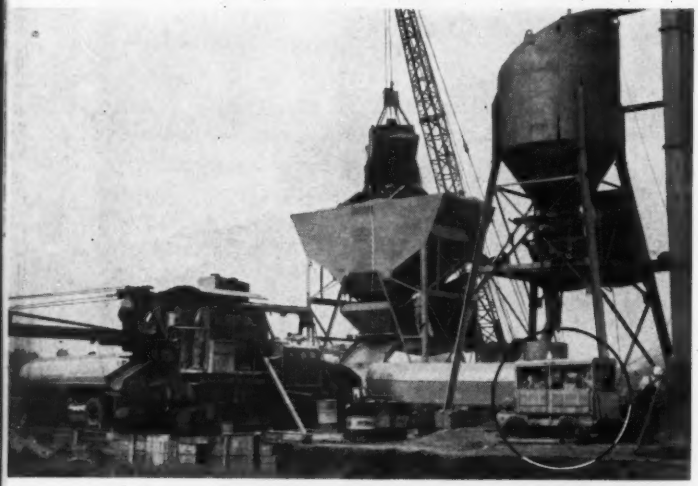
BLAW-KNOX COMPANY

Construction Equipment
300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Cat power saved these owners $1,300

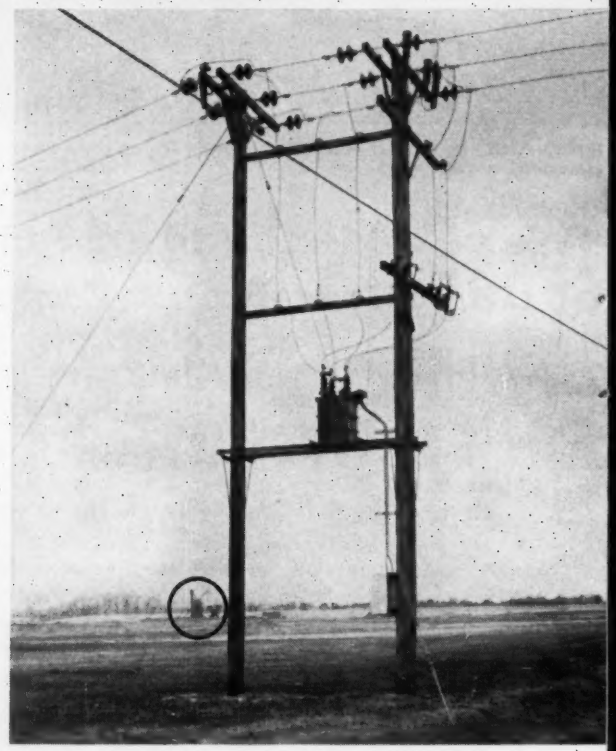


1 McDougal-Hartmann Co.'s, Heltzel Bin Hardy and Johnson Automatic Batching Plant follows their 40 KW Cat D315 Portable Electric Set to its fourth job site. Savings during the first year of ownership while moving them, alone have amounted to $3,900. Operational savings are not even included. The owners estimate that running in and hooking up to public utility power would have averaged at least $1,300 per move. An additional $1,200 was saved at the outset since the Electric Set would operate the plant's higher voltage electric motors which were supplied as original equipment.



2 At a previous job location in Sterling, Illinois, this unit produced 86.4 batches per hour for use on one of the firm's nearby road construction jobs.

Without portable power, it often requires the more common technique of setting up the batch plant along a railroad siding or right-of-way, bringing in materials by rail if the haul distance to the job is not excessive. Concrete specifications in some states limit the haul distance of mixed concrete due to the time element. All in all, Cat portable power saves operating time, cuts costs.



3 Many contracting companies with multi-state operations, such as McDougal-Hartmann, require power portability to avoid the frequent high cost and inconvenience of obtaining power in remote areas.

On their present job it would have necessitated stringing poles and wire from this power line to the plant location (in the circle). Instead, the highly mobile Cat Electric Set was rolled up alongside the batching plant, and hooked up with wall plug simplicity ready to go.

each time their batching plant moved

4 Performance and savings with this plant brought Mr. Jack Hartmann, Vice President (right), and Bud Moore, his C.D.E.S. (Caterpillar Dealer Engine Specialist), out to the job to plan a second batching plant installation. Satisfaction resulted in an order for a second identical Cat Electric Set for this contractor's expanding operations.

Mr. Hartmann remarked, "ABOUT ONE MORE MOVE AND OUR FIRST PORTABLE ELECTRIC SET WILL HAVE PAID FOR ITSELF IN SAVINGS FROM MOVES ALONE AND IN LESS THAN TWO YEARS. THAT WE LIKE TO SEE."

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

5 The all-new, self-regulated generator for Cat Electric Sets is simple to operate. Voltage is adjustable from 5% above to 10% below nominal rating and regulated within 3½% of rated voltage. It has unsurpassed motor starting ability. Other performance features Mr. Hartmann liked were:

1. Low over-all cost per operating hour.
2. No down time due to power failure or engine failure.
3. No additional help required, due to the unit's simplicity and self-regulating standard equipment.
4. Advertised power produced and maintained.
5. His Caterpillar Dealer Engine Specialist, Parts and Service teams were on around-the-clock availability if anything went wrong. It didn't.

ENGINE POWER BY CATERPILLAR

If something has gone wrong with your present engine or it just won't produce in your excavator, crusher or other construction machinery, talk it over with your C.D.E.S. He can aid you profitably when repowering older machines or specifying engines for new equipment.

Engine Division, Dept. CM10
CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

Send me more information about the new Caterpillar Portable Electric Sets. I understand that I am under no obligation.

☐ I would like more detailed information as I may be in the market for a Caterpillar Construction Engine.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

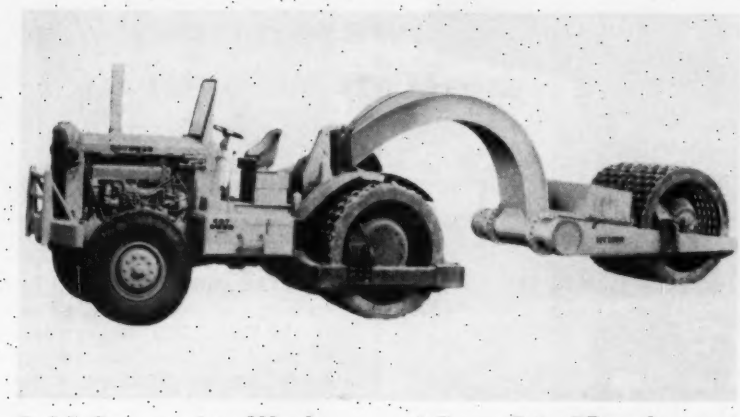
More Power...Easier Operation...Less Maintenance

We put it squarely up to builders and contractors all over the country. Homelite engineers wanted to know what you need in a lightweight gasoline engine driven generator. And here's the Homelite solution . . . a brand-new unit that weighs only 140 pounds and gives you full 3000 watts. It has the extra power to run extra tools and floodlights. And you don't have to operate rheostats or other controls. The voltage is automatically controlled within four per cent from no load to full load. This new Homelite model 8A is completely free from trouble makers. No DC brushes. No commutator. No DC windings on armature. See it in action, right away. Two models are available . . . 115 volt and 115/230 volt, both 60 cycle, AC.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE
CARRYABLE
GENERATORS PUMPS • CHAIN SAWS BLOWERS

HOMELITE • A DIVISION OF TEXTRON INC., 1010 RIVERDALE AVE., PORT CHESTER, N.Y.
In Canada — Terry Machinery Co., Ltd.



Grid Compactor Works at From 5 to 15 mph

The new DW20A compactor combines high-speed operation with deep-penetration compaction. The machine is a Caterpillar DW20 prime mover with two Hyster Grid wheels mounted on its driving axle, plus a towed two-wheel Grid unit. Working at speeds ranging from 5.5 to 15.3 mph, the machine compacts a 10 ft 2 in. wide surface. Grid wheels are heat treated, cast alloy steel. Ballast consists of steel slabs on both the tractor and the towed unit. In on-the-job tests, the machine compacted more than 10,000 yd of pit-run shale per 10-hr shift while averaging about 9 mph.—**Hyster Co., 2902 N. E. Clackamas St., Portland 8, Ore.**

Hugs the Ground

A spring-mounted oscillating front axle allows the front wheels of this ⅜-yd Lorain self-propelled excavator to hug the ground as four-wheel drive carries the machine over rough terrain. Hang-up and wheel-spin problems are all but eliminated.—**Thew Shovel Co., Lorain, Ohio.**

continued on next page

HEY! YOUR SLIP IS SHOWING!

And *your* slip is showing, too, when your crawler tracks start spinning.

But you can restore full pulling power to your worn grousers in less than 30 minutes in the field with MARQUETTE's Tractor Strip "retread."

And you can save 30% or more – up to $400 – of the cost of a new set of grousers by using easy-to-weld Tractor Strip. Often, it lasts longer than original grouser bars! Sizes available to fit *all* tracks.

Write MARQUETTE today for the name of your nearest dealer who handles Tractor Strip and the full line of MARQUETTE welders, welding accessories and battery charger-tester equipment.

MARQUETTE

MARQUETTE MANUFACTURING COMPANY, INC.
307 Hennepin Avenue • Dept. 8-1010 • Minneapolis 14, Minn.

New Optical Plummet Built into Gurley Transit Saves Set-up Time, Improves Accuracy on Windy Days

Years ago, Gurley introduced lightweight instruments to combat wind vibrations. Now Gurley further beats the wind problem with an optical plummet *built into* the instrument.

The new Gurley Optical Plummet Transit eliminates swing and sway of the cord and plumb—always time-consuming and exasperating on a windy location, and inaccurate as well. Positive accuracy of set-up is assured with the Gurley Optical Plummet.

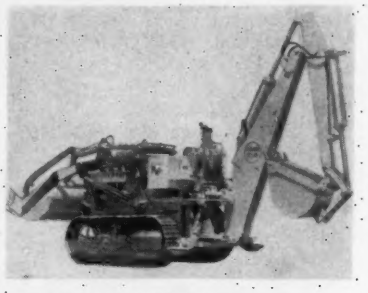
The new Gurley transit is furnished with a tripod with built-in shifting head, and allows a two-inch shift of the instrument over the point. This provides greater latitude in initial set-up.

Gurley's new Optical Plummet Transit offers one of the advantages of the optical-reading theodolite *plus* the desirable features of simplicity and universal acceptance of the American transit. For further details, ask for Bulletin OP-100.

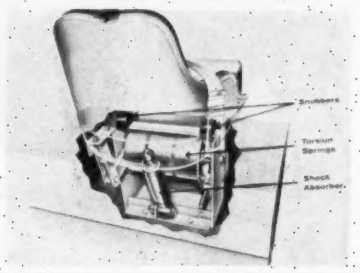
GURLEY

W. & L. E. GURLEY 521 Fulton Street, Troy, New York

Gurley—Since 1845



UTILITY MACHINE — A new crawler-mounted backhoe-loader, the Model 310, has been added to the J. I. Case line. Attachments are mounted on a basic tractor that develops 30 drawbar hp. The Case-built backhoe and loader are operated at 1,600 psi with power supplied by a 19-gpm pump. The entire matched unit is manufactured and warranted by Case. The backhoe digs 12½ ft deep, reaches more than 16 ft from its pivot, and swings through 180 deg. A foot-operated swing control leaves the operator's hands free to work bucket levers while swinging. The ⅝-yd front-end loader exerts 4,300 lb of breakaway force, lifts a maximum of 2,600 lb, and clears almost 9 ft with the bucket in the dumping position. The tractor features a universal-joint drive between clutch and transmission to minimize stress on the drive train. The tractor keeps power on both tracks while turning. Standard shoes are 11 in. wide, and grousers to 14 in. are optional. The loader can be replaced with a bulldozer or angledozer.—**J. I. Case Co., Racine, Wisc.**



EASY RIDING—The new Torsionflex seat, designed to iron out the bumps on haul roads, is available on all Caterpillar rubber-tired tractors. The new seat has three resilient rubber torsion springs. These rubber cushions are aligned horizontally and fixed at one end of the seat frame. The base of the seat is mounted on the other end and the shock of ground

How to turn a swamp into acres of dollars ...with an ELLICOTT DRAGON*

From muck . . . . . .

. . . . . to model homes,

the "before and after" of land reclamation using an Ellicott DRAGON.

A Typical Job: creating land for a blue-chip summer vacation area on Barnegat Bay, N. J. Two-thirds of the 180 acres of raw marsh land were under water.

They Cut Filling Costs in Half by using an Ellicott DRAGON model hydraulic dredge. It paid for itself in a few months. At a land-fill investment as low as $1,500.00 an acre, developers are producing land that will bring up to $12,000.00 an acre when market-ready.

Many Other Projects are producing similar results in Florida, along the Great Lakes, and elsewhere. The DRAGONS accomplish three jobs in one: dig swiftly under water through sand or light gravel, transport their own fill at varying distances, and grade to a smooth, compact surface. Ellicott DRAGON models can be moved overland from job to job by truck or low-boy.

For Land Reclamation, or for any dredging operation, the DRAGON will prove to be your most economical investment. Write today for Bulletin 937—Turning Swamps Into Dollars. Learn all about the economics and mechanics involved. Ellicott engineers will gladly make recommendations on any dredging problem without obligation. 4439

*T. M. REG. U.S. PAT. OFFICE MARQUE DÉPOSÉE

ELLICOTT

TRADE MARK REG. U.S. PAT. OFF. MARQUE DÉPOSÉE MARCA REGISTRADA

ELLICOTT MACHINE CORPORATION

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Subsidiaries: Dragues Ellicott France, Paris, France; Ellicott de Mexico, Mexico City, Mex.; Ellicott Fabricators, Inc., Baltimore, Md.; McConway & Torley Corp., Pittsburgh, Pa.; Baltimore Foundry & Machine Corp., Baltimore, Md.

Successors to the floating dredge business of the Bucyrus-Erie Co. and the American Steel Dredge Co. Complete engineering sales and repair parts service.

Send for the FREE BULLETIN

ELLICOTT MACHINE CORPORATION
1605 Bush Street • Baltimore 30, Maryland

Please send me Bulletin 937, "Turning Swamps into Dollars."

NAME_____

ADDRESS_____

COMPANY_____

CITY_____ ZONE____ STATE_____

GARDNER-DENVER "AIR TRAC" DEMONSTRATION IN PRINT

DRILLING TIME CUT 71%

AIR CONSUMPTION CUT 60%

THERE ARE 29 GARDNER-DENVER DEMONSTRATION POINTS IN THE CONSTRUCTION FIELD

Contact Gardner-Denver and arrange for a demonstration of Gardner-Denver drilling equipment in your quarry. Write today.

DRILLING LABOR COSTS CUT 59%

POWDER COSTS CUT 29%

Quarry: Shelbina Quarry of HALL & RILEY QUARRIES and CONSTRUCTION COMPANY, Boonville, Missouri

Formation: Burlington formation . . . fitchery with flint seams . . . hard to break

Equipment: One Gardner-Denver deluxe "Air Trac"® • One DH123 deep hole drill • Ring seal shank • Sectional drill rods • Couplings • 2¾" carbide bits

Plan for Demonstration: 7′ x 10′ spacing • 24′ hole depth • Number of holes—36 • Tons in shot—4500 • Holes loaded with 60% dynamite below water level and ammonium nitrate above

HERE'S A DETAILED REPORT ON DEMONSTRATED SAVINGS

	"AIR TRAC" DEMONSTRATION	WAGON DRILLS FORMERLY USED	SAVINGS
Tons in shot	4500	4500	
Number of drills	1	2	1
Spacing	7′ x 10′	4′ x 7′	
Hole size	2¾"	2¼"	
Tons per foot	5.4	2.16	
Number of holes required	36	90	54
Lineal feet drilled	864	2160	1296
Time required to drill out	10½ hrs.	18 hrs. each drill	25½ hrs.
Pounds of explosives	1675	1800	
Cost per pound	15.6¢	20.5¢	4.9¢
Ton of rock per pound	2.7	2.5	
Cost explosive per ton	5.8	8.2	2.4
Powder cost	$262.62	$369.00	$108.00
Drillers required	1	2	1
Drill labor cost	$15.75	$38.25	$22.50
Compressor hours	10½	18	7½
Average air consumption per foot of hole	200 cfm.	200 cfm.	
Total air used	172,800 cu. ft.	432,000 cu. ft.	259,200 cu. ft.
Full load time on compressor	4.8 hrs.	12 hrs.	7.2 hrs.
Compressor fuel consumption (based on 10 gal. per hr.)	48 gal.	120 gal.	72 gal.
Fuel savings on 4500 tons			$10.80

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

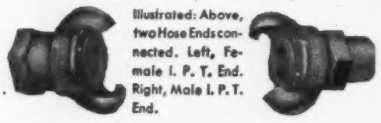
Quick Action...and Tight, Pressure-Proof Connections

"AIR KING"

Quick-Acting, Universal HOSE COUPLING

FOR COMPRESSORS, ALL TYPES OF AIR TOOLS, WATER, OIL AND SPRAY SERVICE

This versatile coupling is built along plain, rugged lines to assure long, trouble-free service under severest working conditions.



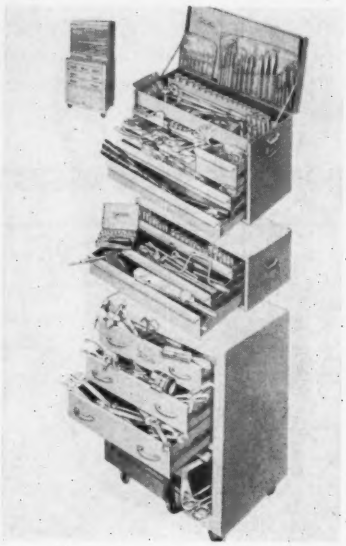
Illustrated: Above, two Hose Ends connected. Left, Female I. P. T. End. Right, Male I. P. T. End.

The "Air King" will reduce operating costs wherever quick connections are required. Locking heads are identical for all sizes of hose or threaded ends within the coupling's size range, and are locked by pressing together and applying a quarter-turn. Equipped with patented Safety Locking Device. Bronze or rustproofed malleable iron, in sizes up to 1".

Stocked by Manufacturers and Distributors of Industrial Rubber Products

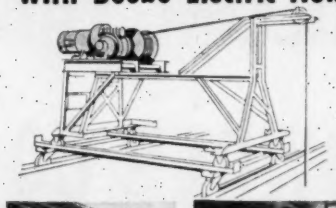
DIXON
Valve & Coupling Co.
GENERAL OFFICES & FACTORY—PHILADELPHIA 22, PA.
BRANCHES—CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON
DIXON VALVE & COUPLING CO., LTD., TORONTO Associate Companies

impacts is absorbed as the rubber springs twist. To dampen oscillation or rebound a double-acting hydraulic shock absorber is also included in the design. The combination of these two shock-dampaning components effectively controls the operator's ride. An adjustment handle on the seat allows the operator to fix the seat to match his weight. According to Caterpillar, operators weighing from 130 to 260 lb are assured an equally smooth ride. The seat may be tilted forward by the operator to protect it from weather when not in use. Seat belts are standard equipment on the DW20 and DW21 Torsionflex seats—**Caterpillar Tractor Co., Peoria, Ill.**



COMPLETE SHOP—A set of 232 tools, complete with chest, drawer section, and roller assembly, is now available from Snap-on Tools Corp. Covering every standard tool that might possibly be used around a shop, the set ranges from tinner's snips to an electric circuit tester. Other tools include socket, combination, ignition, tappet, and hex head wrenches; pliers, screw drivers, wire brush, steel tape rule, ball peen hammers, plastic tip hammers, brake adjusting tools, spark plug gage, feeler gage, valve tools, piston ring compressor, pry bar, carbon scraper, and a ring groove tool. The standard tool chest and drawer section are pictured but other drawer arrangements are available. A raised rim around the roller top and corner retainers on the drawer section

HEAVY
SLABS LIFTED with Beebe Electric Hoist



The Guy E. Hall Company, contractor on the 4½ million dollar Kern County Administration Building in California, had a special problem:

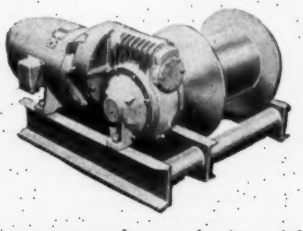
What kind of electric hoist was best suited to lifting concrete facing slabs, weighing as much as 2,000 pounds apiece, into place on a 7-story building? And how could this hoist be quickly and easily moved along the face of the building?

The right answer to the first question, the Guy E. Hall Company found, was a Beebe model 2000A Electric Hoist. Here was the ideal electric hoist for this job, because its reliable lifting power was subject to the accurate and instant control necessary in spotting these heavy slabs. Furthermore, the reversible motor of the Beebe Electric Hoist has an internal magnetic brake.

To give the hoist mobility, it was mounted on the framework shown here. The framework was then equipped with anti-friction casters, and a standard channel track was laid parallel to the face of the building. Then the Beebe hoist, mounted in the framework, was rolled sideways to whatever position needed.

This ingenious use of a Beebe Electric Hoist is only one of the many applications to which these heavy-duty hoists are suited. Beebe Electric Hoists come in capacities up to 10,000 pounds and in custom-engineered and standard models.

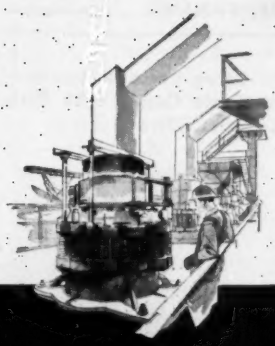
Remember Beebe Electric Hoists yourself, next time you need a lift.



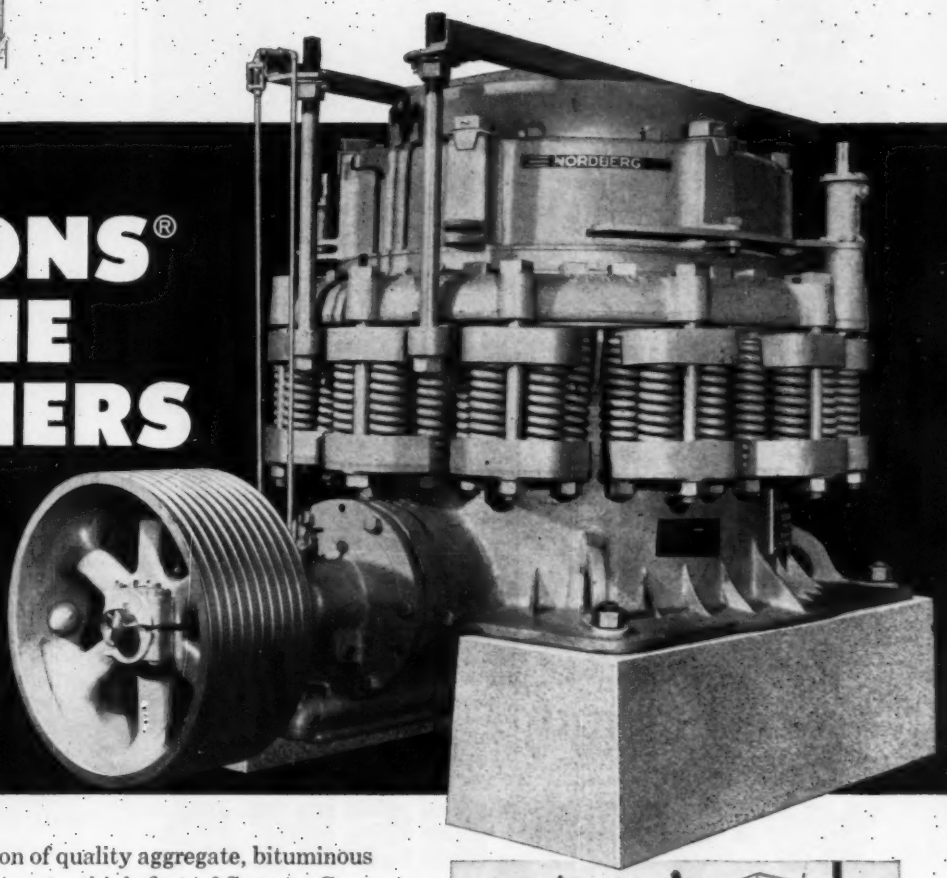
strongest geared power for its weight in the world

Beebe Bros.
BEEBE BROS WINCHES
2730 Sixth Ave. So. • Seattle 4, Washington

You get Quality Aggregate at lower cost with...

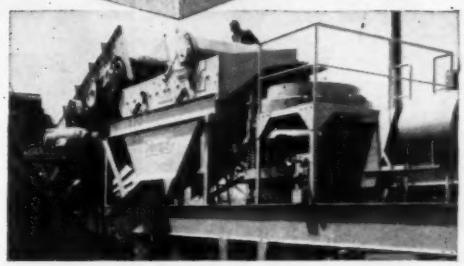


SYMONS® CONE CRUSHERS



For continuous production of quality aggregate, bituminous mixes and sand at lower cost—think first of Symons Cone Crushers—heavy duty, versatile crushers that produce more material to desired specifications, use less power, and give long service with low maintenance. Good reasons why these Nordberg built crushers are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Cone Crushers for both stationary and portable service. Write for descriptive data on Symons Cone Crushers—built in sizes to produce from 6 to 900 or more tons per hour.



IN PORTABLE SERVICE

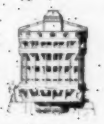
Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids portable crushing plant utilizing a 4' Symons Cone Crusher, shown above.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

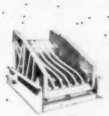
NORDBERG

© 1958, N-M Co.

C-358

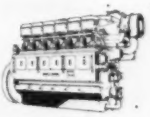


SYMONS GYRATORY CRUSHERS



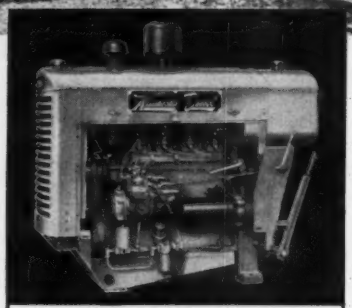
SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS



NORDBERG ENGINES

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D. F.



Powerful Waukesha Utility Four—Model 180-DLCU Diesel—four cylinder, 3½-in. bore x 3¾-in. stroke, 144 cu. in. displacement, counterbalanced crankshaft.

REICH *drills* either way
ROTARY or
DOWN-THE-HOLE
with

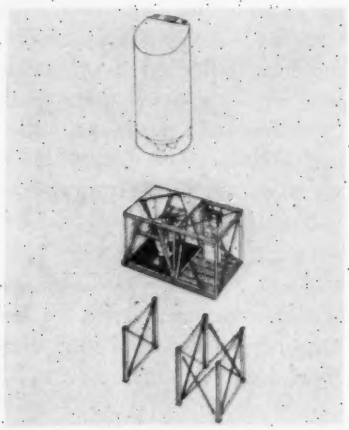
WAUKESHA *Diesel* POWER

The *small* rig that's designed for down-the-hole tool drilling of holes up to 6½-in. diam. in hard rock—the Waukesha Diesel-powered, Model C-250 Reich Drill is said to be the only machine of its kind in the world. It does the work of small hard rock rigs that drill with drifters; and large hard rock machines that drill with down-the-hole tools. But the Reich is only half the size... and half the cost...of large machines. The makers, Reich Bros. Mfg. Co., Terre Haute, Ind., gave the drill an equally versatile power unit. The Waukesha 180-DLCU has special Diesel design characteristics including the patented spherical combustion chamber which gives lively responsive acceleration, smoothness of operation, and clean burning with high economies both of maintenance and fuel. Get the details of Waukesha dependability in Bulletin 1627.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
NEW YORK TULSA LOS ANGELES 399

hold the three units in place.—**Snap-on Tools Corp., 8028 28th Ave., Kenosha, Wisc.**

PACKAGED GREASE—A new, easy-to-use cartridge has been added to the Lubriplate line. The cartridges contain Lubriplate No. 630-2, a high-temperature, extreme-pressure, water-repellent grease that is adaptable for practically all general-purpose lubrication. The cartridge fits all standard guns. It is inserted quickly and easily without touching the grease. The standard package contains 10 cartridges in a handy carrying carton.—**Lubriplate Div., Fiske Bros. Refining Co., Newark, N.J.**



CEMENT BATCHER—Johnson's Automaster-C cement batch plant combines high production with quick assembly and disassembly features. The automatic plant's elevated silo has a 390-bbl, 1,560-cu ft capacity and it can be arranged to service one or two

batchers. The silo has a low-pressure, diffuse-aeration system with filter, pressure regulator, and gage; a flow indicator and high-pressure by-pass; and high and low-level signals with lights and buzzer alarms. One or two 14-cu-ft, 1,000-lb scale batchers can be used. Batch gates are operated by air rams with electric control and manual over-ride. Cement weight is automatically rechecked and discharge gates lock if the batch is wrong. All controls, including interlocks and indicator lights, are mounted in the scale cabinet. Elevators, screw conveyors, and ground storage silos are available in a wide range of capacities.—**C. S. Johnson Co., Champaign, Ill.**

NEW FILTER—W. G. B. Oil Clarifier, Inc., has added a 500-cu-in. unit to its line of oil filters. The new filter utilizes an aircraft-type, V-band clamp that makes it possible to change cartridges without tools in less than 3 min. The filter uses W.G.B.'s regular S-48B-C replacement cartridge. The cover of the filter has a vent that releases air. It can be fitted with a gage to indicate whether a filtering element is plugged. A neoprene O-ring stops cover leakage. The shell of the filter is made of lightweight, drawn steel that is free of welded seams. The filters's flow rate, which is rated at a maximum of 1½ gpm, is controlled by a restricting orifice that is located in the fitting that secures the cartridge in position. Connections are standard ¼-in. pipe treads.—**W. G. B. Oil Clarifier, Inc., Kingston, N.Y.**

continued on page 190

THE TROWEL THAT GOT AWAY

THIS COULDN'T HAPPEN...

with a STOW ROTO-TROWEL

The exclusive manual clutch control is one of the big reasons why more contractors specify Stow Roto-Trowels. Merely by letting go of Stow's Dead-Man Clutch Control the operator stops the blades WITHOUT stopping the engine. Recent tests prove that the blades come to a complete stop *one-sixth of a second* after the operator releases the handle.

With this important safety feature the operator can keep the engine of the Roto-Trowel running while he lets go of the machine to pick up a pebble from the concrete or light a cigarette.

The Stow Roto-Trowel is easier to start too. With the exclusive Stow clutch, the throttle may be set in any position for starting. This has eliminated starting difficulties caused by the non-adjustable centrifugal clutch.

Stow Roto-Trowels also feature blade pitch control on the handle, adjustable handle for height, chrome-vanadium steel blades and lifting hook on the engine. Available in 24", 29", 34", 42" and 46" trowel diameters, with a range of eight models to choose from, Stow Roto-Trowels are built for safety and long life, built to produce excellent concrete finishes.

Look up your distributor in the yellow pages of your phone book under "Concrete Vibrators" or

A Complete Line of Concrete Construction Equipment.

Vibrating Screeds

Grinders

Roto-Trowels

Vibrators

STOW

Manufacturing Co.
31 Shear Street
Binghamton, New York

MAIL THIS COUPON *TODAY!*

Stow Manufacturing Co. 31 Shear Street
Binghamton, New York

I'm interested in the Stow Line of Concrete Construction Equipment. Send a complete catalog and name of nearest distributor.

I am particularly interested in_____

Name_____ Title_____

Company_____

Street_____

City_____ State_____

Western Contracting using

73 of them are Twin-Powered

Stage IV of Oahe Reservoir Project in South Dakota is a huge earthmoving job that involves 24½ million yards of excavation. Western Contracting Corp. is nearly a year ahead of schedule on their contract with the Corps of Engineers which calls for completion by November, 1959.

The Euclid fleet being used by this leading contractor totals 120 units . . . and 73 are big capacity, Twin-Powered scrapers, rear-dumps and crawler tractors. Working two 10-hour shifts 6 days a week, the "Eucs" are making the dirt fly . . . have moved as much as 110,000 yds. a day.

Twenty-five "Twin" Scrapers are push-loaded in heavy shale by big TC-12 Crawlers . . . get loads of about 30 yds. The TS-24 "Eucs" averaged 7½ loads per hour on a 2.2 mile cycle with several long grades up to 5½% adverse. Good supervision and excellent haul roads helped in maintaining this high production, but good loading ability and fast travel speed of the "Eucs" were important factors, too. Project Manager "Rip" Collins commented, ". . . if it weren't for the "Twin", the shale in the spillway section wouldn't be a scraper job".

On big projects like Oahe, and on small yardage work, too, "Twins" are moving the cheapest dirt. Your Euclid dealer can arrange a demonstration on your job and show you why "Twins" give you a greater return on investment . . . get in touch with him before you bid that next job!

EUCLID Division of General Motors, Cleveland 17, Ohio

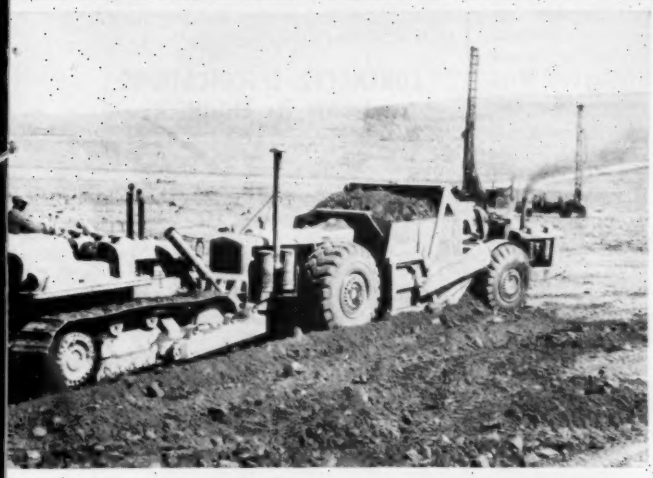
GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

120 "EUCS" at Oahe Dam...

For all big tractor jobs — push-loading large scrapers, heavy dozing, ripping hard shale and pulling big equipment — the TC-12 is a top performer. Independent track drive, full power shift with Torqmatic Drives and a total of 402 h.p. delivered to the power train give this Euclid "Twin" unequalled work-ability. Western has had TC-12 crawlers in their fleet for over 3 years . . . is using 18 of them at Oahe.



▲ *A total of 518 h.p., Torqmatic Drives, power on all four wheels, big capacity and a loading assist by Twin-Power "Euc" Crawlers, add up to high speed production. Here a TS-24 gets a heaped load of about 20 bank yds. of heavy shale in just over a half minute. "Twin" availability has been 90% or better in spite of working 20 hours a day, six days a week in tough material.*

Another application of Euclid "Twin-Power" is the ▶ *50-ton Model LLD. Western Contracting has used this size rear-dump for several years on big jobs such as the Indiana Turnpike, Ft. Randall, Gavins Point and Oahe Dams. With two 300 h.p. engines, each powering a separate axle through Torqmatic Drives, this "Euc" moves 50-ton loads over steep grades at fast travel speeds.*

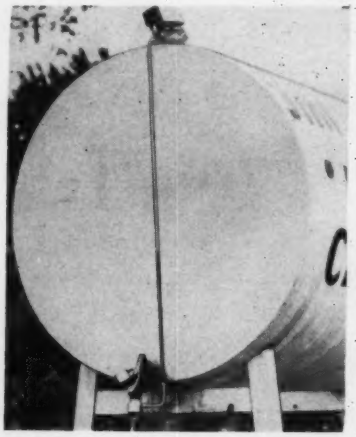
DOUBLE-ACTING PILE HAMMERS

Rapid action jogs soil, reduces pile skin friction to concentrate energy at pile point. Keeps pile moving to aid penetration. Fast, dependable driving into a wide range of soils — in subaqueous operations — battering — extraction. Write for Bulletin 58R.

McK T

McKIERNAN-TERRY CORP.
110 RICHARDS AVE., DOVER, N.J.

EQUIPMENT NEWS . . . continued



FUEL GAGE — An inexpensive, long-lasting gage for overhead fuel tanks has been introduced by Byroad Mfg. Corp. The level is easy to read because fuel actually flows through a clear plastic tubing that is mounted vertically on the outside of the tank. There are no controls inside the tank. The gage can be installed on any overhead tank in from 5 to 15 min, according to the manufacturer. It can be adapted for tanks with either ¾ or 1-in. outlets. A pipe wrench, small hand wrench, and pliers are the only installation tools required. The plastic tubing is impervious to gasoline and oil, and it withstands temperatures from –60 deg to 175 deg F. Should the tube fail, it can be replaced for about 60 cents.—**Byroad Mfg. Corp., 426 S. Hancock St., Indianapolis 22, Ind.**

CHEVY TRUCKS — Increased fuel economy for the pickup line and a new optional power train for two heavy-duty series are features of the 1959 Chevrolet truck line. The number of truck models has been expanded to 139, three more than last year, on 22 wheelbases. Gross vehicle weight ratings range from 4,000 to 36,000 lb. In the light-duty series, major emphasis is on fuel economy. An improved six-cylinder engine with a redesigned camshaft that reduces the time valves are open during the combustion cycle is said to give up to 10% more mileage. The design also increases torque output at low and medium speeds. Brakes on half-ton models also have been improved. The highlight of the heavy-duty line is a new optional power train for 70 and 80-series

McGraw-Hill
BOOK NEWS

COMPOSITE CONSTRUCTION in STEEL and CONCRETE

JUST PUBLISHED—Gives the basis of composite construction and its advantages, develops design equations and procedures, describes methods of connecting slabs to beams, and includes illustrative examples, charts, and tables. Design methods and practical applications are fully covered. **By I. M. Viest, AASHO Road Test; R. S. Fountain, Portland Cement Assoc.; and R. C. Singleton, Nelson Stud Welding Div. of Gregory Industries Inc. 147 pp., 86 illus. and tables, $7.50.**

CONSTRUCTION PLANNING, EQUIPMENT, and METHODS

Shows you how to plan and carry out construction jobs using **the best combination of field-tested methods and engineering fundamentals.** How to analyze the project, prepare all schedules and choose and manage the best equipment and methods for any given job is covered in great detail. Worked-out illustrative examples make all explanations crystal clear. **By R. L. Peurifoy, A.&M. College of Texas. 533 pp., 385 illus., $8.50.**

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2nd ED. JUST PUBLISHED—Brings you simpler ways of appraising the many factors that influence the direct costs of labor, equipment, and materials—*plus* the indirect costs of insurance, taxes, bonds, supervision, overhead, and profit. Over 200 time-saving tables break down operations into workable units such as the amount of material needed for a certain job . . . the man-hours it takes . . . the hourly cost of owning and operating the equipment, etc. Helps you select rates for practically any project under all types of conditions. **By R. L. Peurifoy. 2nd Ed., 446 pp., 83 illus., 220 tables, $10.75.**

CONTRACTS, SPECIFICATIONS and LAW for ENGINEERS

You can insure greater protection for yourself and your clients in drawing up construction contracts with the help of this practical legal guide. Shows how to apply basic principles of contract law to drawings, specifications, surety bonds, instruction to bidders, and related areas. Scores of examples and sample paragraphs. **By C. W. Dunham, Yale U., and R. D. Young, Travelers Insurance Co. 550 pp., illus., $7.50.**

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Are you serious about wanting to cut costs?

Hydra-Lift installed on your truck gives you a *double-duty* piece of equipment, one that lifts *and* hauls. This efficient, single piece of equipment loads material, transports it to the job, sets it off, then is available on the job for all sorts of lifting work. And, taken as a crane alone, never have you seen a more versatile piece of equipment. On Model 60HB, shown above, hydraulic power swings the boom, lifts it and telescopes it . . . enables you to work in tight spots you can't get near with ordinary equipment. Once you own a Hydra-Lift, you'll find it's never idle . . . and every minute it's working, it's saving you money! But why take our word for it. Write for literature today, then ask your Hydra-Lift distributor for an on-the-job demonstration.

AVAILABLE FOR INSTALLATION ON YOUR TRUCK, OR SPECIAL PITMAN CARRIER*

PITMAN HYDRA-LIFT

***HYDRA-LIFT Now Available with Its Own Carrier!**

It's rugged and compact, gives you maximum maneuverability, plus extra stability for extra safety margin on all rated loads. And, same man who drives carrier also operates the crane from a single, swivel seat. Hydra-Lift and carrier available from factory as a package unit. Write today for full details.

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Please send me brochure and name of PITMAN distributor nearest me.

300 WEST 79TH TERRACE
KANSAS CITY, MISSOURI

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Company _____

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City _____ State _____

Bethlehem Hollow Drill Steel tackles sandstone at site of Dyberry Dam, a flood control project in eastern Pennsylvania. Contractor: The Hunkin-Conkey Construction Co., Cleveland. Drill steel reconditioner: Howells Mining Drill Corp., Plymouth, Pa.

They moved 270,000 cu yd for new flood control dam

Using Bethlehem Hollow Drill Steel to drill the blast holes, they recently moved some 270,000 cu yd of sandstone in the initial phase of building Dyberry Dam near Honesdale, Pa. To control the Dyberry Creek, the earth-and-rock dam, 1600 ft long and 112 ft high, is being built under the direction of the U. S. Army Corps of Engineers, Philadelphia district.

The blast holes which were put down by the contractor, The Hunkin-Conkey Construction Co., averaged 10 ft in depth. The Bethlehem Hollow was used in wagon drills, jackhammers, and drifters.

Bethlehem Hollow Drill Steel is ideal for all types of rock drilling because it is rolled from fatigue-resistant steel, and has a uniform, centrally located hole. Besides having a wide quenching range, Bethlehem Hollow is easy to heat-treat for the proper balance of toughness and wear resistance, thus making possible tough threads and shanks.

Bethlehem Hollow comes in Carbon and Ultra-Alloy grades in rounds, hexagons, and quarter octagons, in lengths from 18 ft to 27 ft. Longer lengths can also be furnished. No matter how tough the drilling, you can count on Bethlehem Hollow to give you top performance.

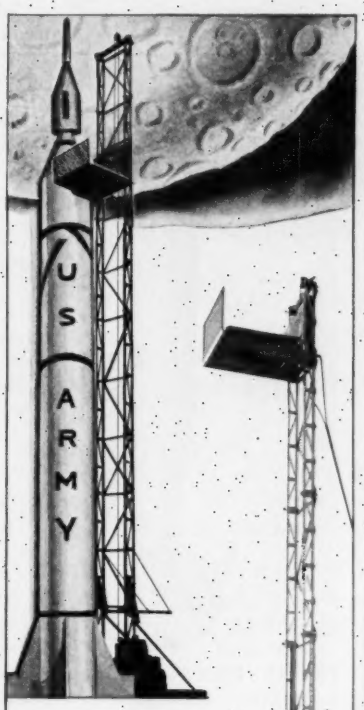
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

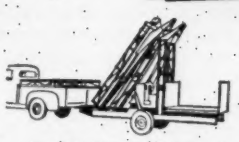
BETHLEHEM HOLLOW DRILL STEEL

CARBON *AND* ULTRA-ALLOY

BETHLEHEM STEEL



To help prepare the JUPITER C for its flight into history —the scientists and engineers at Redstone Arsenal chose the BUCK HOISTOWER.



Tow it right to the jobsite:

the BUCK hoisTower

Self-erecting to a height of 45 ft. The tower can be placed and erected by just one man in 23 minutes.

The HOISTOWER will raise a load of 2500 lbs. to heights of 175 ft. and more. With speeds up to 170 ft. a minute, it is the strongest and fastest portable HOISTOWER in the world.

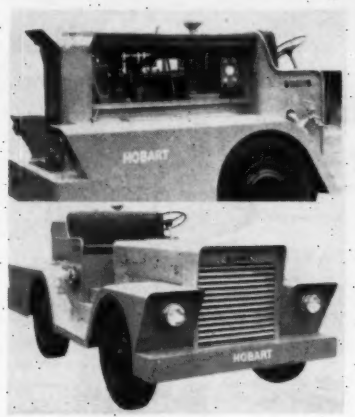
Concrete Buckets, Poop Decks, Booms, Extra Sections and other Accessories, make it the most versatile and money-making machine a contractor can have.

For your nearest dealer or more information—write

BUCK EQUIPMENT CORPORATION
720-B Anderson Ferry Road
Cincinnati 38, Ohio

EQUIPMENT NEWS . . . continued

trucks. It consists of an 185-hp 348-cu-in. engine, heavier clutch, five-speed or Powermatic transmission, and either a 16,000 lb single rear axle or 30,000 lb tandem. This combination results in a 12% increase in pulling power. GCW rating has been increased to 38,000 lb. Other modifications in the heavy-duty line include a new close-ratio five speed transmission; redesigned, aluminized valves; and beefed-up 15,000-lb rear axles. Major improvements in the medium-duty line center on engine improvements. A new thermostatically-controlled bypass cooling system replaces the permanent type formerly used in the 261 cu in. engine and the V8 engines. This system provides more rapid warmup, uniform temperature distribution, and constant coolant circulation.—**Chevrolet Motor Div., General Motors Bldg., Detroit 2, Mich.**



CARRIES AIR—A new self-propelled unit for jobs that require both arc welding current and compressed air has been developed by Hobard Brothers Co. Mounted on the rear of the carrier is a 125-cu-ft rotary-type compressor driven by its own four-cylinder gasoline engine (top photo). The compressor is completely self-contained, except that it draws its gasoline supply from a common fuel tank. The carrier also holds a 600-amp dc welder that is driven by a Chrysler V-8 engine. This engine also drives the vehicle through a Hobart axle and a Chrysler Powerflite transmission and torque converter. The carrier has hydraulic power steering.—**Hobart Brothers Co., Troy, Ohio.**

continued on next page

ANOTHER BENEFIT OF MSA'S NEW HAT SUSPENSION

NO PRESSURE POINTS

MSA's new double cradle suspension for Skullgard Hats and Caps gives you "Fixed-Crown" clearance and adjustable comfort.

Item: In designing the new suspension, uncomfortable *pressure points* have been *eliminated.* Metal snaps, which tend to press against the wearer's head in some safety hats, are recessed into plastic frames in this suspension. The frames cushion the snaps between the sweatband and the man's head. This exclusive design feature reduces layer thickness at possible points of contact.

Other features include: handy locked-in suspension; air cushion sweatband; fast size adjustment; easy-to-clean, long-wearing plastic webbing.

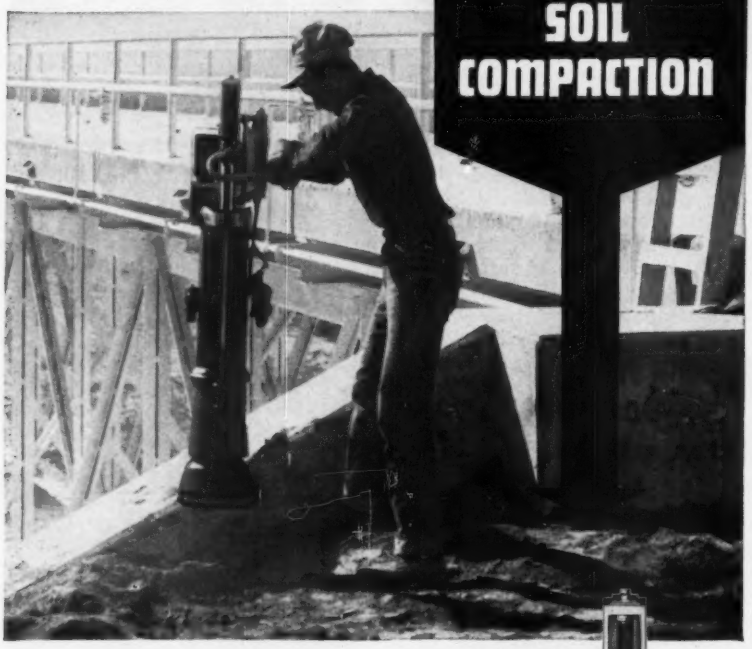
Write for new bulletin for details.

MSA
SAFETY EQUIPMENT HEADQUARTERS

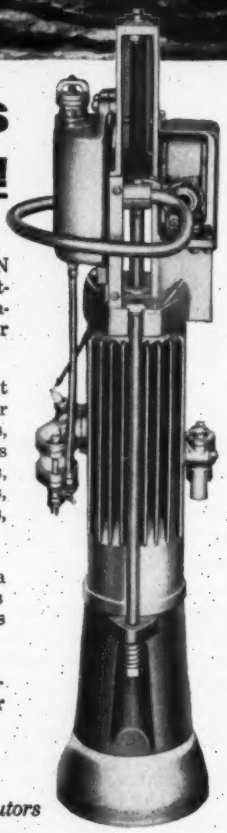
MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue
Pittsburgh 8, Pennsylvania

Where SPECIFICATIONS call for . . . . .

HIGH DEGREE SOIL COMPACTION



BARCO RAMMERS are THE ANSWER!



YOU can't get *high degree* SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches — on all kinds of construction jobs: Toll Roads, Freeways, and Highways; Air and Missile Bases, Hydroelectric Power and Flood Control Dams, Bridges, Buildings, and Housing Developments.

ONE MAN OPERATION — On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

ASK FOR A DEMONSTRATION— We will be glad to arrange a demonstration for you; see our nearest distributor or write.

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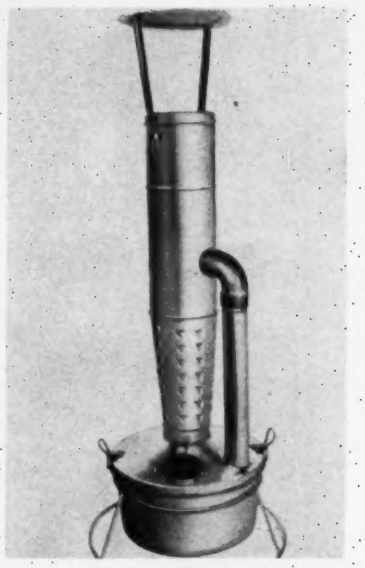
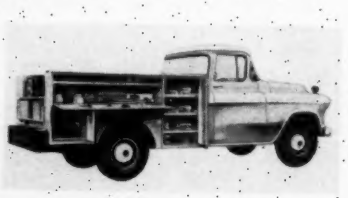
BARCO RAMMER *for High Degree Soil Compaction*
BARCO-VIBRA TAMP *for Granular Fill and Bituminous Surfacing*



CLEAN HEAT—The new Penguin salamander has an outside return pipe that draws off inert gases, soot, and other unburned materials and returns them to the flame. This insures near-complete combustion without soot or waste and results in clean heat with little or no smoke. The salamander is lit with a match and a damper is provided to extinguish the flame. Output is controlled by a regulator that determines the size of the fire in the stack. Using kerosene or domestic fuel oil, the salamander produces up to 140,000 btu and burns up to 20 hr on one filling, according to the manufacturer. The unit is 63 in. high and weighs 28 lb.—**C. R. Daniels, Inc., Daniels, Md.**



A PLACE FOR EVERYTHING—This ¾-ton service and utility truck body keeps tools and other equipment safe and readily available. Divided storage areas can be made larger or smaller by removing shelves or re-spacing bin dividers. Shelves mounted on die-formed steel brackets lift out easily to make room for larger equipment. Dividers can be re-spaced on one-inch centers to create tray or bin space for small

CAT FUEL INJECTION EQUIPMENT CUTS COSTS BY PROVIDING MAXIMUM ENGINE PERFORMANCE

Presetting at factory for accurate performance eliminates field settings, makes installation of Caterpillar fuel injection pumps quick and simple.

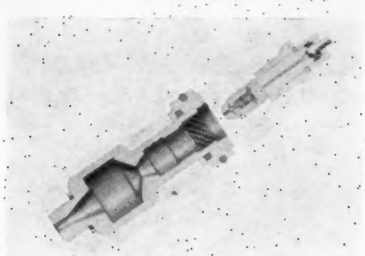
The fuel injection system is a key to peak engine performance. It must deliver to each cylinder equal amounts of fuel at precisely the right time. Deviation means a loss in horsepower. That's why it pays to use Cat fuel injection equipment.

Cat injection equipment can save you money in other ways, too. No field or operating adjustments are necessary. Installation is *quick and simple*. All pumps are interchangeable for different cylinders and between engines of the same model.

This interchangeability permits smaller parts inventories, makes replacement inexpensive by eliminating custom fitting, and makes replacement possible in a matter of *minutes* right on the job regardless of the experience of the mechanic.

Genuine Caterpillar injection equipment is built to last. With clean fuel, a life of 20,000 service meter hours is not unusual.

Pumps, plungers and barrels are manufactured from the finest chromium alloy, so hard that diamond dust is required for lapping the plungers and barrels. Pumps are tested and preset at the factory to provide accurate metering, timing and fuel pressure.



HIGHEST STANDARDS in the industry go into the manufacture of Caterpillar fuel injection equipment. Pump plungers and barrels, for example, are finished to tolerances so fine that the heat from your hand will expand a plunger enough to make it larger than the matching barrel.

SERVICE TIP

Your Caterpillar Dealer has the testing equipment to determine accurately when fuel injection systems parts should be replaced. And testing is the only sure way of knowing.

RUN-IN TESTS—four hours on pumps, two on valves – are conducted on these Caterpillar-built test machines before a pump or valve leaves the factory. Strict testing procedure means perfect performance of genuine Caterpillar injection parts.

Single-orifice fuel injection valves minimize the possibility of clogging or fouling. A spring-loaded plunger within the valve opens by fuel pressure at the proper time for uniform and precise injection. Extra protection is given by a fine-mesh screen. This clean, accurate injection means less down time and lowest fuel cost per unit of power.

Don't risk real damage to your Caterpillar equipment with an improperly functioning fuel injection system. Test systems regularly and replace worn parts with genuine Caterpillar parts. Your Caterpillar Dealer has the full story. See him today. And remember, he stands behind every part he sells.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

Improper fuel injection equipment can be expensive. For instance, if a machine's owning and operating cost is $10 per hour, its total cost in a 2,000-hour season is $20,000. For a 200-horsepower machine that's $100 per horsepower. A poorly functioning fuel injection system which robs the machine of 5% of its horsepower (10 HP) could mean a season loss of $1,000 (10 [HP] x $100). Don't take chances. Standardize on Cat equipment.

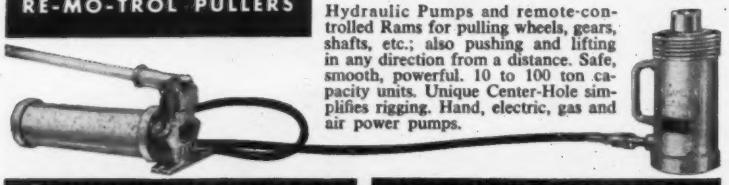
CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Push, Pull or Lift Safely with SIMPLEX

HYDRAULIC EQUIPMENT

RE-MO-TROL PULLERS



Hydraulic Pumps and remote-controlled Rams for pulling wheels, gears, shafts, etc.; also pushing and lifting in any direction from a distance. Safe, smooth, powerful. 10 to 100 ton capacity units. Unique Center-Hole simplifies rigging. Hand, electric, gas and air power pumps.

JENNY "CENTER-HOLE" PULLERS

Self-contained Hydraulic Pullers with famous Center-Hole for easy pulling, pushing, lifting. Rugged, versatile; 6 models, 30 to 100 ton capacities.

STANDARD HYDRAULIC JACKS

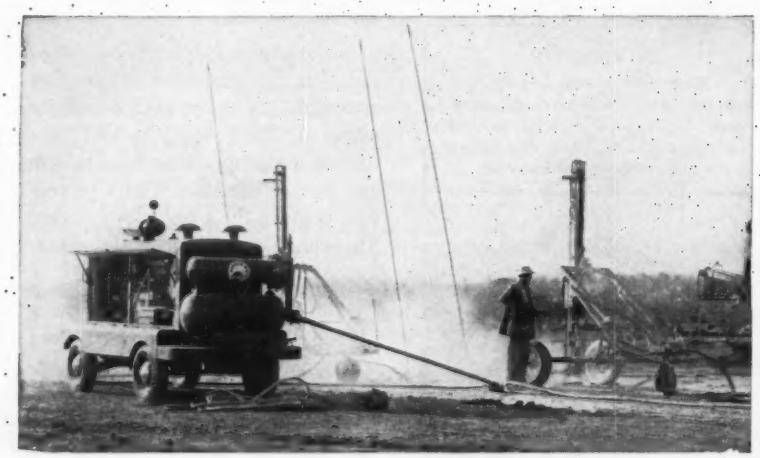
Sturdy, safe, efficient units to do any lifting job easy and fast. 8 models; 3 to 100 ton capacities.

Get full information on the most complete industrial line of Hydraulic Jacking and Pulling equipment; write for Hydraulic Bulletin.

WORLD'S LARGEST MAKERS OF INDUSTRIAL MECHANICAL AND HYDRAULIC JACKS

SIMPLEX JACKS

TEMPLETON, KENLY & CO.
2509 Gardner Road, Broadview, Ill.



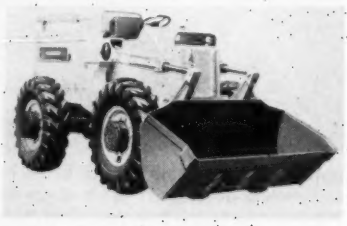
Only Jaeger delivers 600 cfm at 1650 rpm

Although powered with the same GM 6-71 diesel engine as the Jaeger "600", other compressors run 150 rpm faster to produce the same 600 cfm of air. In 8 hours' continuous operation a Jaeger averages 72,000 fewer revolutions, saves miles of engine piston travel and many pounds of fuel. Jaeger "125", "250" and "365" sizes are comparably efficient. See your Jaeger distributor for complete cost-saving data, or request Catalog JC-7.

THE JAEGER MACHINE CO., 800 Dublin Ave., Columbus 16, Ohio

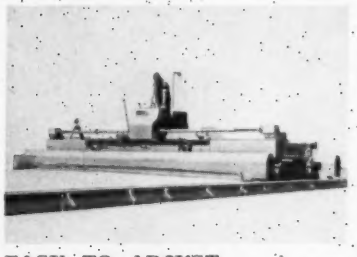
parts or tools. No tools are required to change the arrangement of shelves or dividers. Storage compartments have double-panel doors equipped with recessed handles and locks. Depending on size, the bodies are made from 12, 14, or 16-gage cold rolled steel that is electrically welded into an integral unit. The understructure is braced with U-girders and the ribbed front bulkhead protects the cab and driver against shifting loads. Other features include reinforced tailgates and safety-tred floors. — **Reading Body Works, Inc., Reading, Pa.**

VISUAL CONTROL—The Rol-a-chart, a new visual control board, might help solve your scheduling problems with a minimum of paper work. Entries are made directly on a rotating, transparent plastic sleeve with a marking pencil. No typing, tables, or cards are needed. The sleeve wipes clean with a swipe of a cloth. The continuous sleeve moves across a fixed grid that can be set up for any time interval from minutes to months. The board takes only 4 sq ft of wall space, yet provides 8 sq ft of scheduling space. Schedules can be checked by moving the sleeve forward or backward across the rollers. Sturdily built of steel, the Rol-a-chart comes with wall hangers, folding easel, and a carrying handle. It can be hung on a wall or stood on a desk. **—Conley, Baltzer & Steward, 494 Jefferson St., San Francisco, Calif.**



BEEFED-UP LOADER — The four-wheel-drive model H-70 tractor-shovel replaces the Hough

HH Payloader. Capacity of the new machine is 7,000 lb. New engine options include a 105-hp gasoline engine and either a two or four-cycle, 110-hp diesel. Improved weight distribution provides an additional 1,500 lb of weight on the rear wheels, making possible better traction and greater digging effort. Beefed-up components include a stronger main frame, boom arms, and bucket linkage. Axle assemblies are wider and from 40 to 80% stronger than the previous Payloader model. The H-70 also features a triple-action air cleaner system including a pre-cleaner and two oil-bath cleaners; a larger, single-stage torque converter; a three-speed Paylomatic powershift transmission; and power-transfer differentials.—**Frank G. Hough Co., 706 7th Ave., Libertyville, Ill.**

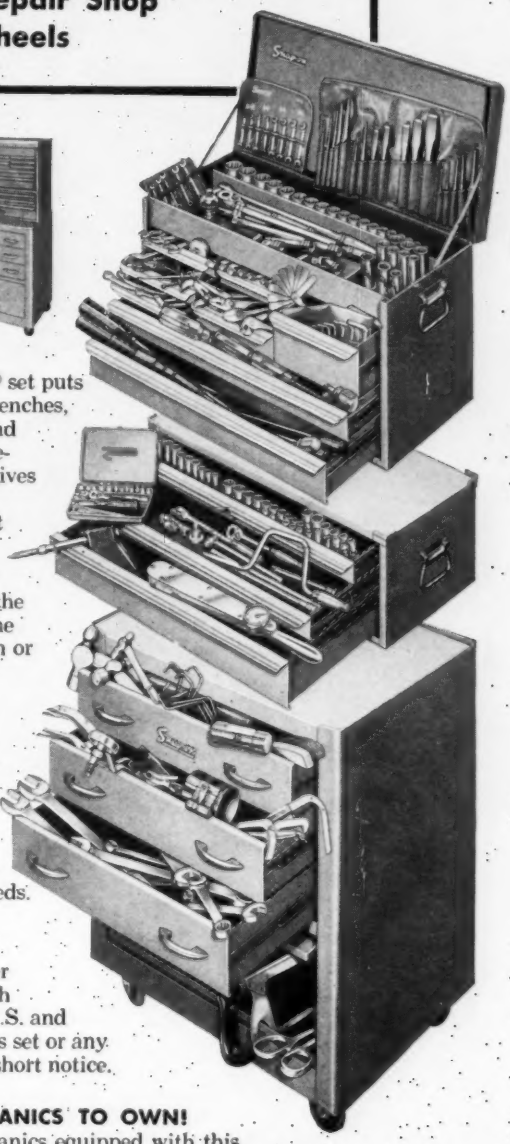


EASY TO ADJUST — A new transverse finisher featuring a single-lever adjustment for crown transitions has been added to the Koehring line. The one-man-operated finisher has two hydraulically raised screeds that oscillate at 23.6, 34.2, and 56.4 strokes per min. Screed stroke length is variable and the rear screed is located behind the rear wheels. The finisher works on slabs from 10 to 30 ft wide. Standard adjustable width settings are 10 to 18 ft, 18 to 26 ft, and 22 to 30 ft. Traction speeds available during the finishing operation are 8, 11.7, and 19.5 fpm. An additional speed of 81.5 fpm is available when non-finishing movement is necessary. The finishers frame can be extended and retracted hydraulically. Two rubber-tired transportation wheels also can be raised and lowered hydraulically. Power for the unit is provided by a 22.5 hp gasoline engine. All controls are grouped within easy reach of the operator. — **Koehring Div., Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wisc.**

CUT DOWNTIME TIE-UPS

with this Repair Shop on Wheels

New *Snap-on* 5232 GS-BB set



This big, new *Snap-on*® set puts 232 of the most used wrenches, sockets, screwdrivers and other tools right at a mechanic's finger tips — gives him a real tool layout that gets idle equipment back into action fast.

IT'S PORTABLE! Roll the complete unit around the shop — load any section or all of it on a pickup truck for transport to the job site.

IT'S FLEXIBLE! Get any part of the set or make substitutions either in tools or the drawer combinations to fit your own needs.

IT'S IMMEDIATELY AVAILABLE — wherever you are! With 58 branch offices throughout the U.S. and Canada, you can get this set or any other *Snap-on* tools on short notice.

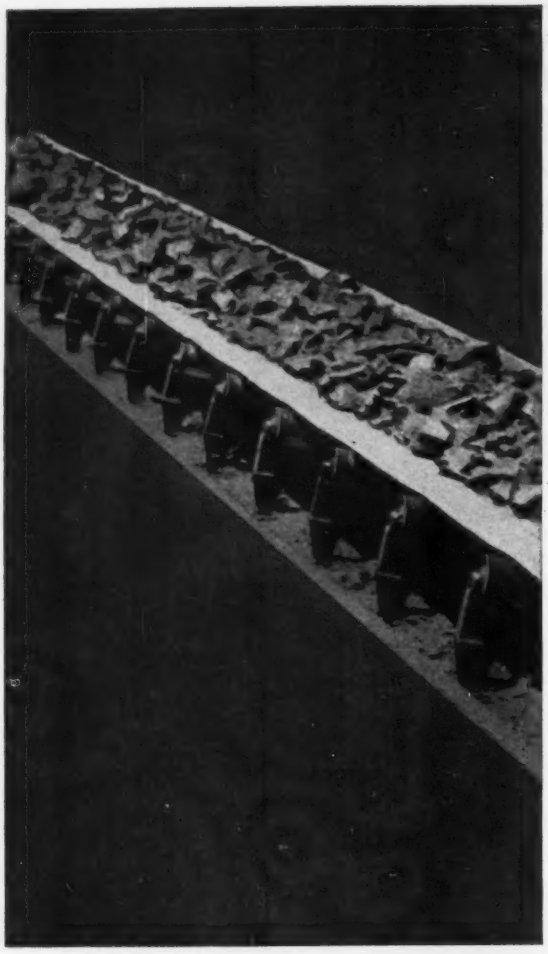
IT'S EASY FOR MECHANICS TO OWN! If you want your mechanics equipped with this set, show them this ad. Convenient credit terms make it easy to own.

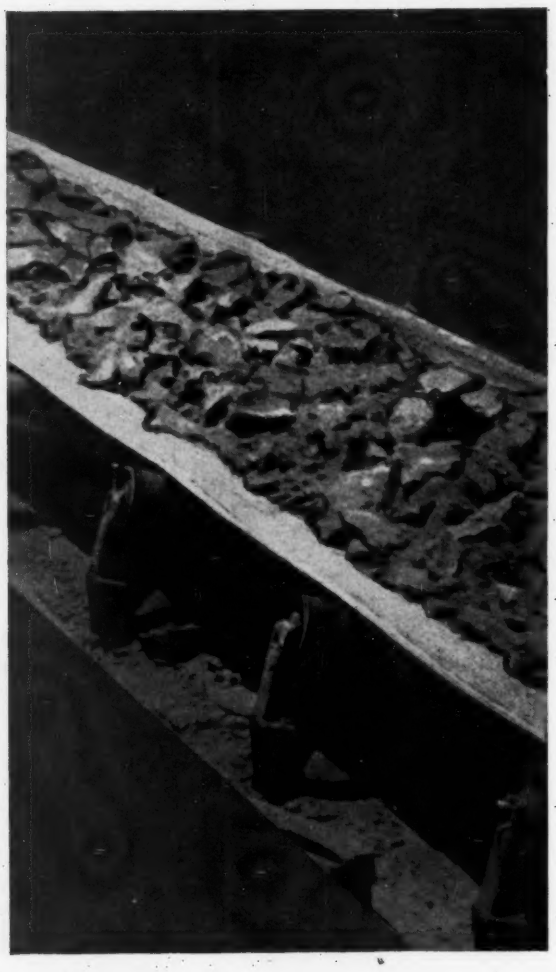
Don't let lack of the right tools jam up your repair schedules. This 5232 GS-BB set gives you a range of tools and tool sizes to service both light and heavy equipment. And, top-quality *Snap-on* tools have the feel, fit and long life that run-of-the-mill tools can't begin to match.

Get full details about this set from your Snap-on man.

SNAP-ON TOOLS
CORPORATION
8042-J 28th Avenue • Kenosha, Wisconsin

WHY BUY

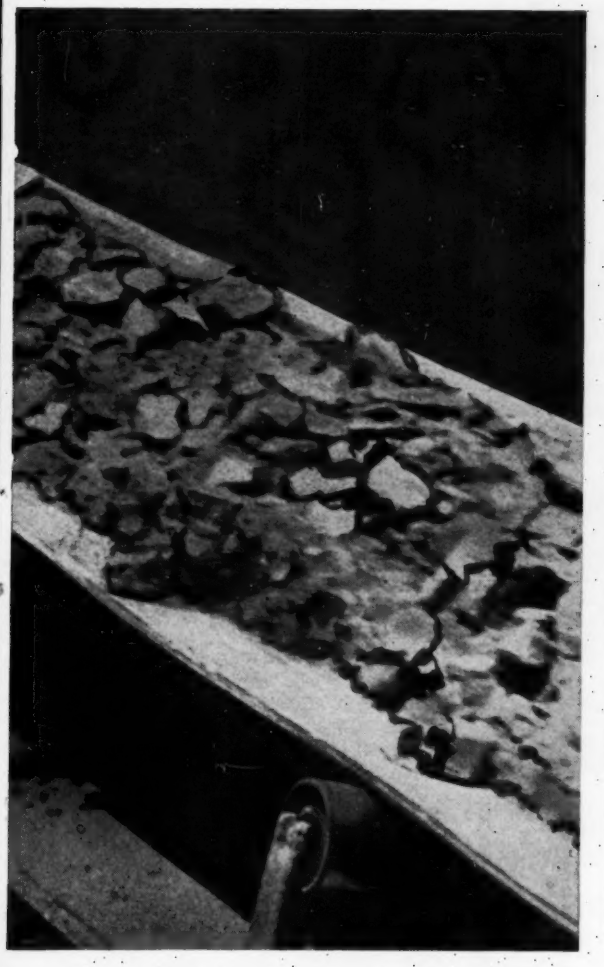




ONLY 2/3 OF A BELT?

...it's the Last Third of an R/M Conveyor Belt that Gives

for your "More Use ~~per~~ Dollar"



It's the *last* one-third of conveyor belt life that determines its final cost. Real conveyor belt cost is the cost per foot of belt in terms of load carrying capacity for the *potential service life of the belt.* R/M's new conveyor belt construction now assures you ⅓ longer belt life! Here's why:

R/M engineers recognize that every belt feature—troughability, resiliency, fastener holding ability, strength member fabric, cover toughness and thickness—help determine the true cost of Ray-Man Conveyor Belt on your job. And that's why every Ray-Man component is precision proportioned to assure better belt balance where it pays off most for you—in longer belt service life!

Let an R/M representative show you how *extra* life in the last ⅓ of conveyor belt service means "More Use per Dollar" with Ray-Man Conveyor Belt and other R/M heavy duty constructions.

RAY-MAN CONVEYOR BELT

- Trains Naturally
- Resists Impact and Ripping
- Double Compensation Relieves Outer-Ply Stress
- Holds Fasteners
- Requires No Breaker Ply
- Exclusive "XDC" Long-Wear Cover
- Moisture Resistant, Mildew-Proof

RM812

BELTS • HOSE • ROLL COVERINGS • TANK LININGS • INDUSTRIAL RUBBER SPECIALTIES

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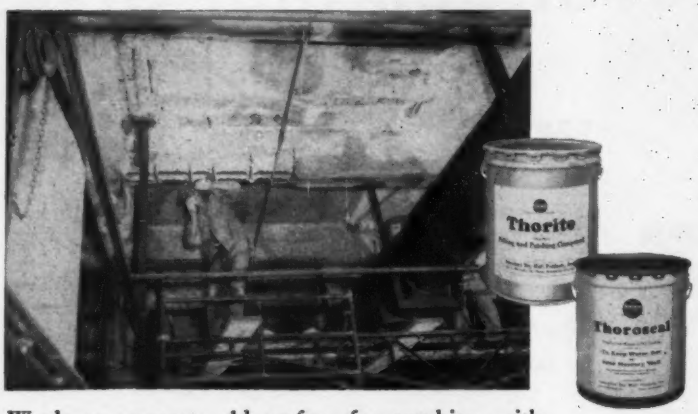
RAYBESTOS-MANHATTAN, INC.

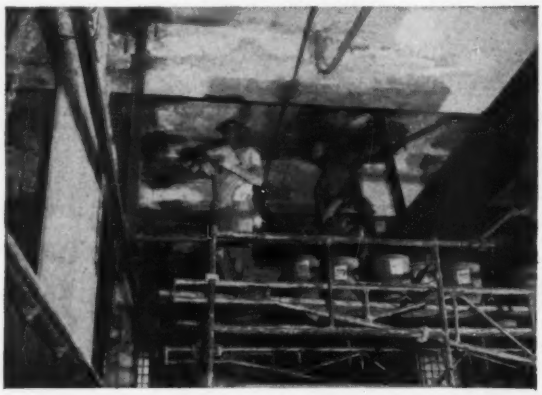
Other R/M products: Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

How THORITE and THOROSEAL made this underground structure sound again!



Workmen prepare old surface for patching with THORITE.

Water has entered the concrete and caused corrosion of reinforcing rods, blistering the concrete off surface and causing structural weakness throughout building.



Reinforcing was cleaned, all corrosion was removed and brush coat of THORITE applied over entire patching area, then filled in with trowel coats of THORITE, even with surrounding surfaces.

THORITE Patching Mortar sets in 20 to 30 minutes and can be coated with THOROSEAL while hardening.

"How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.

New Publications

These catalogs and bulletins from manufacturers contain useful information about construction equipment and materials. To obtain a copy, write directly to the manufacturer at the address given.

SOIL TESTING—The American Society for Testing Materials has published two books on soil testing. The first, "Procedures for Testing Soils," (552-p) describes 112 test methods, of which 39 are new since the last edition of the publication in 1950. Soil mechanics is a complex science, and it is difficult to establish testing standards. The ASTM Committee D-18 on Soils for Engineering Purposes has sponsored this publication in an effort to bring together all methods now in current use. Many of them will eventually become ASTM standards. Price of the book is $6.75. The second publication, "Conference on Soils for Engineering Purposes," (500-p), contains 15 papers and discussions presented at a recent soils conference held in Mexico City. Price $9.—**American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.**

CATERPILLAR BOOKLETS—Five new booklets give helpful hints on Caterpillar products. Form D837, "Balanced Power . . . Matched to the Job," is an 8-p booklet suggesting how to choose the right size equipment for the job. Form DE839, "Not an Element of Doubt" gives service tips on filter replacement. Form D841, "Increase Power, Production, Profit," discusses the capabilities of large crawler tractors. Form D817, "Don't Buy in the Dark," covers the make-up and maintenance of track rollers. Form DE844, "A Caterpillar Specialty," discusses track shoes and hardware.—**Advertising Division, Caterpillar Tractor Co., Peoria, Ill.**

NEW SHOVEL—Manitowoc Engineering Corp. announces the publication of a 12-p catalog describing the new Manitowoc 1½-yd, Model 2300 shovel which is easily converted to 1½-yd clamshell or trench hoe, 1½ to 2½-yd dragline or 35-ton crane. The bulletin describes the hydraulic jack

adjustment of the crawler drive assuring even crawler tension at all times, controlled clutch ventilation, and the new flat-designed 62-in. roller path that minimizes strain on the king pin.—**Manitowoc Engineering Corp., Manitowoc, Wis.**

SPEED REDUCERS—Link-Belt Company has issued a new 24-p booklet describing its completely new line of shaft-mounted speed reducers. "Shaft-Mounted Speed Reducers," Book 2618, contains engineering and selection information on single reduction drives in six sizes with nominal ratios of 5 to 1 and capacities up to 50 hp, and double reduction drives in seven sizes with nominal ratios of 15 to 1 and up to 40 hp.—**Link-Belt Company, Dept. PR, Prudential Plaza, Chicago 1, Ill.**

CONCRETE EQUIPMENT—Stow Mfg. Co. has put out a 20-p catalog, No. 580, on its complete line of concrete equipment. The booklet covers universal electric vibrators, motor-in-head vibrators, midget vibrators, rotary trowels, portable concrete grinders, ceiling grinders, and vibrating screeds. Also included are complete directions for building your own prestressed screed beam.—**Stow Mfg. Co., 31 Shear St., Binghamton, N. Y.**

SNAP-ON TOOLS—A new 156-p Industrial Tool Catalog represents a hand tool buying guide for engineers, production, and maintenance men. Dimensions and specifications for every type and size of power-driven nut runners and impact wrenches are included. The catalong also lists a complete range of automotive tools and shop equipment for fleet owners. — **Snap-on Tools Corp., 8028 - 28th Ave., Kenosha, Wis.**

FILTER SAMPLES—Fram Corp. has prepared a master catalog and sales kit. The catalog contains four sections: Industrial catalog, 20 p; General products catalog, 16 p; Air filter catalog, 36 p; Filter specifications catalog, 76 p. The sales kit contains a master catalog plus samples of "Filcron" filters.—**Fram Corp., Providence 16, R. I.**

CONCRETE PAVER — A 16-p bulletin describes the Blaw-Knox concrete paving spreader. Included are on-the-job pictures, operation diagrams, and a job-

One man can do it in 2 minutes with a LaCrosse TILT-TRAILER

Just tilt . . . load . . . and your equipment is ready to roll to your next job *in minutes*, with a LaCrosse Tilt-Trailer. There's an economical size and type for every hauling need — from *6 to 22-ton capacity* — with hydraulic "cushioning cylinders" standard on most models. Furthermore, when you buy a LaCrosse Tilt-Trailer, you get the same *rugged*, high-quality construction that goes into all LaCrosse low-beds — plus a *full-year factory warranty*, to protect your investment.

4 types . . . 6 to 22-ton capacity

Type LTA-4 — 6 or 8-ton capacity. 6½' x 14' platform with oscillating tandem axle and hinged drawbar.

Type TSA-2 — 8 or 10-ton capacity. 8' x 17' platform with single H-beam axle and adjustable drawbar.

Type DTTA — 13, 16 and 20-ton capacity. 8' x 18'5" platform with tandem axle and adjustable drawbar.

Type GTTA — 14, 18 and 22-ton capacity. 8' x 21'-2¾" platform with "walking-beam" tandem axle, patented 1-piece gooseneck.

LC-51

Mail for more facts

LaCROSSE TRAILER CORP., Dept. J114, LaCrosse, Wis.

Tell me more about LaCrosse Trailers (..... ton capacity)

☐ Std. Low-Bed ☐ Tilt-Type ☐ Removable Gooseneck

☐ Send name of nearest LaCrosse Trailer Distributor

Name ..... Title.....

Employed by .....

Address .....

City ..... State.....

Heavy metal fabrication since 1865

LaCROSSE

... the low-bed backed by a 1-year warranty

What Happens When You Can't Cross Property Lines to Form a Wall?

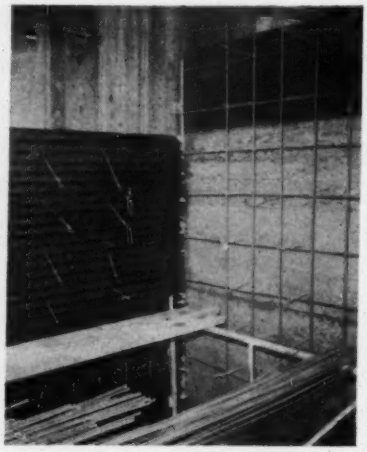
This contractor had one-inch clearance to work in...solved the problem with Gates.

Problem: In forming the 14-foot-high foundation walls of this job, the contractor was not allowed to trespass on the adjoining property. All forming had to be done from the inside.

Solution: Gates Vertical Rod System. The contractor used asphalt-coated corrugated metal for the outside form panels, and conventional Gates methods for the inside wall. After the concrete was poured, coated metal sheets and 14-foot steel rods were left in place.

Results: Quality concrete at the *same low cost* of conventional Gates forming.

Find out how the versatile Gates Systems can solve your forming problems.



Concrete forms—foundation wall of Harris Building, Oklahoma City, Oklahoma. Note corrugated metal used for outside form panels.

GATES IT'S GALVANIZED

Gates & Sons, Inc.

80 SO. GALAPAGO STREET DENVER 23, COLORADO

Branches in Spokane, Wash., Rochester, N.Y., Lethbridge, Alta., Canada

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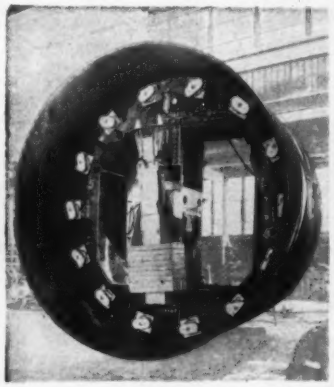
MAYO SANDHOG EQUIPMENT



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FREE BULLETIN No. 23 shows installations of Mayo shields, cylindrical air locks, lock doors, medical locks and tunnel cars. Send for your free copy today.

SPECIAL EQUIPMENT DEVELOPED FOR SPECIAL PROBLEMS

MAYO

MAYO TUNNEL AND MINE EQUIPMENT

LANCASTER, PENNA.

NEW WRIGHT Type "C" Pull-A-Ways

THREE SIZES 1½, 3 and 6 Tons

FEATURES

- Lubricated for life
- Hooks are drop-forged
- Special alloy-steel chains
- Chain sheaves of drop-forged alloy steel
- Gear teeth cut to precision limits
- Load brake is dependable and safe
- Weights:

1½-ton, 23½ lbs.
3-ton, 36½ lbs.
6-ton, 63 lbs.

ACCO

Write to York, Pa., office for complete information

Wright Hoist Division
AMERICAN CHAIN & CABLE

York, Pa., Bridgeport, Conn.

NEW PUBLICATIONS...
continued

proved paving method. Also described are the automatic transverse blade and vibratory paving attachment. Bulletin 2485R. — **Sales Promotion Department, Construction Equipment, Blaw-Knox Co., Mattoon, Ill.**

SCAFFOLDING—A revised catalog M-R on steel trestles and scaffolding accessories for use by painters, plasterers and other light construction and maintenance workers has just been released by the Patent Scaffolding Co. Included are specifications and suggestions as to where to use them for efficient and safe working conditions. — **Patent Scaffolding Co., 38-21 - 12th St., Long Island City 1, New York.**

WIRE ROPE LUBRICATION—Red-Strand Bulletin No. 103 describes how the service life of wire rope can be lengthened substantially by proper lubrication and safe storage.—**Leschen Wire Rope Division, H. K. Porter Co., 2727 Hamilton Ave., St. Louis 12, Mo.**

WELDING HANDBOOK — The American Welding Society announces the availability of Section II of the Fourth Edition of the Welding Handbook. It covers Gas, Arc & Resistance Welding Processes. Section I dealt with the fundamentals of welding and was published in September, 1957. Section two contains 13 chapters and costs $9.—**American Welding Society, 33 West 39th St., New York 18, N. Y.**

VIBRATORY EQUIPMENT — Syntron Co. has issued two new bulletins. A 14-p booklet contains data for Syntron's complete line of nine vibrating grizzly bar screens, 48 sizes of "Concentric-Action" vibrating screens, seven screening models, 20 unbalanced pulley vibrating screens and four electromagnetic vibrating screens. A 30-p catalog covers standard and special model electromagnetic vibrating feeders for hard-to-handle bulk materials.—**Syntron Company, 500 Lexington Ave., Homer City, Pa.**

STEEL SHEETING—An 8-p bulletin by Armco describes lightweight corrugated steel sheeting for trenches, cofferdams, cutoff

walls, and shore protection. Included are job applications, physical properties, driving data, and design data for wales and struts. **—Armco Drainage & Metal Products, Inc., Middletown, Ohio.**

RAYMOND PRODUCTS—A new 26-p catalog describing design, construction, and installation of prestressed concrete cylinder piles is available from Raymond International Inc. A Raymond subsidiary, the Centreline Corp., also has published a catalog. It describes a process of in-place centrifugal cement lining of pipes from 4 to 144 in. in dia.—**Raymond International Inc., 140 Cedar St., New York 6, N. Y.**

LUBRICATION—An illustrated folder describes the use of D-A Torque Fluid in heavy-duty automatic transmissions, torque converters, rotary air compressors, and hydraulic systems. A second folder by the D-A Lubricant Co. gives information on D-A rock drill lubricant, which is compounded for all rock drills, and D-A Rock Drill 500, a heavy lubricant designed for Joy TM500 rock drills. — **D-A Lubricant Company, Inc., Indianapolis 23. Ind.**

EUCLID LINE—Euclid Division of General Motors Corp. has just released a new brochure describing its entire line of earthmoving equipment. Included are condensed specifications on nine rear dumps, three bottom dumps, three coal haulers, six scrapers, one crawler tractor and two log haulers. Form 326R.—**Euclid Division, General Motors Corp., Cleveland 17, Ohio.**

TAPPING PIPE—A 12-p booklet gives on-the-job photos and instructions that describe the step-by-step procedure for tapping Price prestressed concrete steel-cylinder pipe under pressure.—**Price Brothers Co., 1932 E. Monument Ave., Dayton 1, Ohio.**

LUBRICATION — A new brochure, form CFT-58, describes the importance of proper lubrication of construction and other heavy duty equipment and machinery. — **Lubriplate Division, Fiske Brothers, Refining Co., 129 Lockwood St., Newark 5, N. J.**

CARCO WINCHES HANDLED TOUGHEST JOBS ON LARGE PIPELINE PROJECT

Three nationally known pipeline contractors shared in the difficult job of building the Pacific Northwest pipeline through the mountainous terrain between Umatilla, Oregon, and Chehalis, Washington.

All three of these contractors used Carco winches for towing, holding and lowering heavy equipment up and down grades that averaged around 50% to 55%.

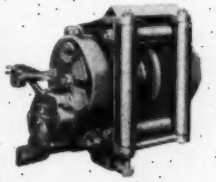
The Engineers Limited Pipeline Company of San Francisco, for example, used five International TD-24 tractors equipped with Carco Model J winches.

These husky, dependable Carco winches were continually called upon to perform tasks that only properly engineered and ruggedly built equipment could stand as a day after day diet.

It's no small assignment to skid huge boulders out of the right of way, to tow, hold and lower heavy equipment like trenchers and backhoes up and down steep grades, to do the same for two tractors carrying joints of 26" pipe or large sideboom tractors, to tow and lower welders, coating pots and other jobs of like nature. Yet Carco winches did all these, took them in stride and asked for more.

Similar experiences are responsible for the fact that practical pipeliners everywhere know that Carco winches are thoroughly and completely dependable — in truth, are one of the most reliable pieces of contractor's equipment on the market.

See your nearest Carco dealer. He will help you select the model that best fits your needs. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branch at Chicago, Illinois.



Four roller fairlead, available at added cost for Model J, maintains maximum line pull while winching loads from any direction.

The Model J constant mesh 4-stage gear train, by high ratio of gear reduction, converts tractor power into line pull directly and efficiently.

Carco winches are nationally known for their efficient performance and dependability. That's why Carco makes more winches for more makes and models of industrial tractors than any other producer.

CARCO®

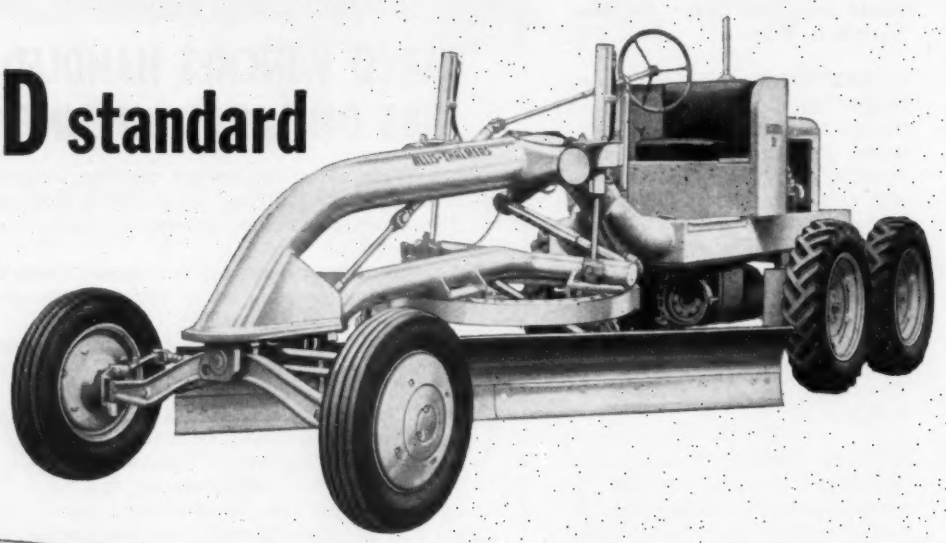
...for big economy on maintenance

GET THE ALLIS-CHALMERS

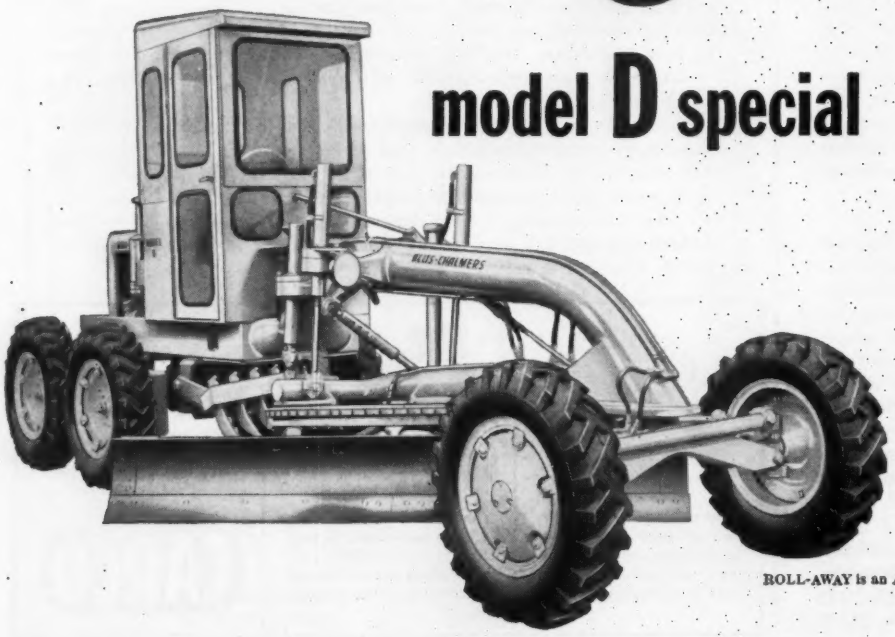
Here's the original low-cost motor grader with big-grader design and performance advantages. The Model D handles so many jobs so well, you have to see it at work to convince yourself. Your Allis-Chalmers dealer can arrange a demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

model D standard

50 hp
Approx. weight
8,800 lb (gasoline)
Approx. weight
9,350 lb (diesel)



model D special



50 hp
Approx. weight
10,900 lb (gasoline)
Approx. weight
11,450 lb (diesel)
4 forward speeds to 25 mph (approx.)
1 reverse speed to 3 mph (approx.)
All-steel cab*
Shiftable moldboard*
Hydraulic scarifier*
Leaning front wheels*
Power circle turn*

*Also available with the model D standard as optional equipment.

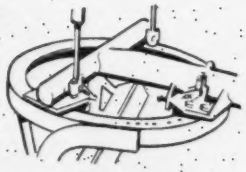
ROLL-AWAY is an Allis-Chalmers trademark.

and construction work

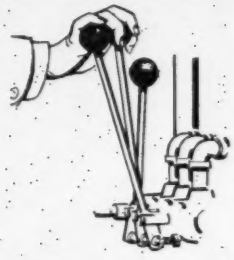
MODEL D MOTOR GRADER

many production-boosting advantages

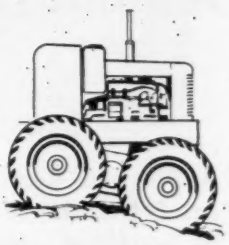
The ROLL-AWAY moldboard rolls dirt up and ahead to eliminate packing, reducing friction . . . gives you more performance per horsepower, more production per gallon of fuel.



Revolving circle and heavy tubular drawbar provide exceptionally stable moldboard mounting.

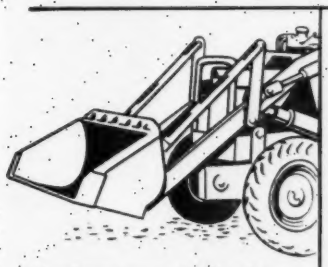


Convenient hydraulic controls, easy to operate. Two levers fit into one hand to control circle lift.

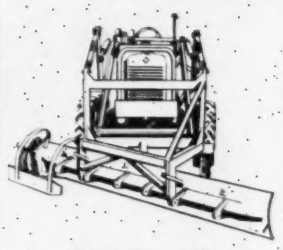


Positive tandem drive gives you four driving wheels under the heavy end of the grader.

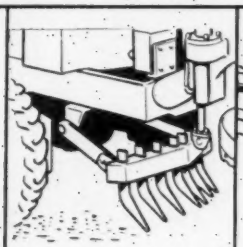
many job-multiplying attachments



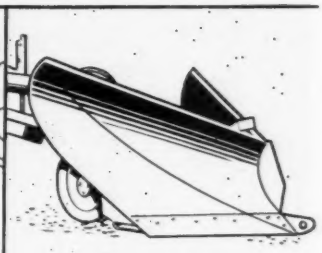
⅝-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



Blade and V-type snowplows

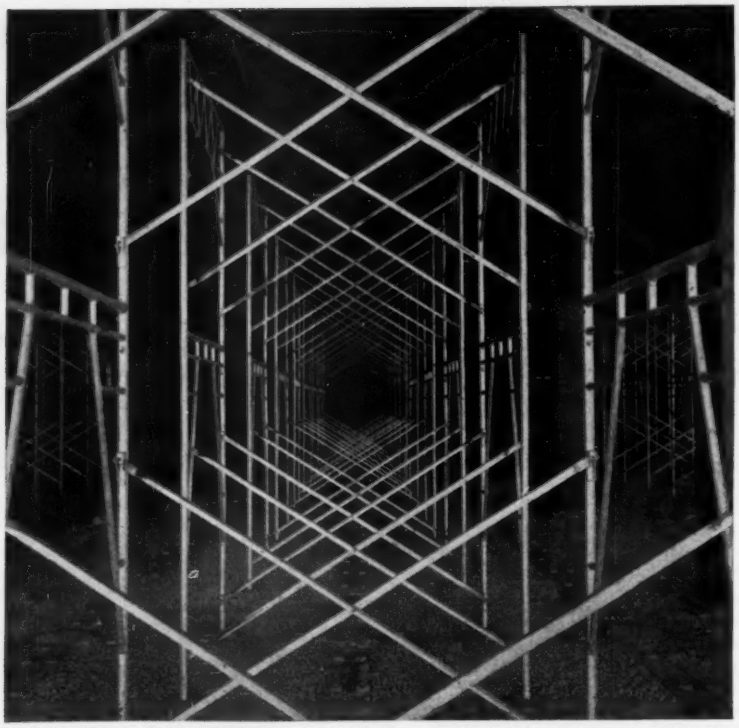
ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Look ahead... *move ahead*...and stay ahead

with ALLIS-CHALMERS

Scaffolding Methods . . .

A Picture Report on Efficient Ways to Scaffold, and Shore Concrete . . . by Patent Scaffolding Co.



NEAT, QUICK SLAB SUPPORT—Simple, easy-to-handle parts of prefab "Trouble Saver" Sectional Steel Scaffolding fit together rapidly to form this neat, efficient and safe, slab shoring for nine floors and roof of the new Southwestern Bell Telephone Co. Bldg., Fort Worth. 396 5'-high deep-trussed frames, 396 6'6"-high shallow-trussed frames and 396 3'-high deep-trussed frames are assembled with diagonal braces, fast-acting, patented SlideLoks and bases to the exact height required for the slab forming work. Neatness of job conditions undoubtedly contributed to time savings and safety for the contractor, Henger Construction Co.

HIGH FRAMES PERMIT BANKING AS USUAL—Providing for banking conditions as usual, during ceiling alterations for the Fidelity Union Trust Co., East Orange, N. J., is no trick at all for general contractor, Robert A. Howie, Jr. & Sons. 10'-high frames of "Trouble Saver"® Scaffolding, not only provide the ceiling-height working platforms, but also permit ample walk-through space for banking activity on the floor.

PIER SHORING ALSO MAKES FORMING SCAFFOLD—By assembling "Trouble Saver" Shoring 2'-wide ladder frames in 16'6"-high towers spaced 1'8" apart in one bay and 11½" apart in the other bay of this pier, two purposes are achieved. One, ample shoring support for a 3'9"-wide by 5'4"-deep concrete beam. Two, adequate platform area for forming work. Robert M. Murray, Inc., contractor for Horseheads Highway bridge job, East Corning, N. Y.

Complete scaffolding equipment and engineering service offered through nation-wide sales offices or representatives. Look under Patent Scaffolding in the Yellow Pages for your nearest source.

SALES **RENTALS**

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

GOLD MEDAL LADDERS SCAFFOLDING

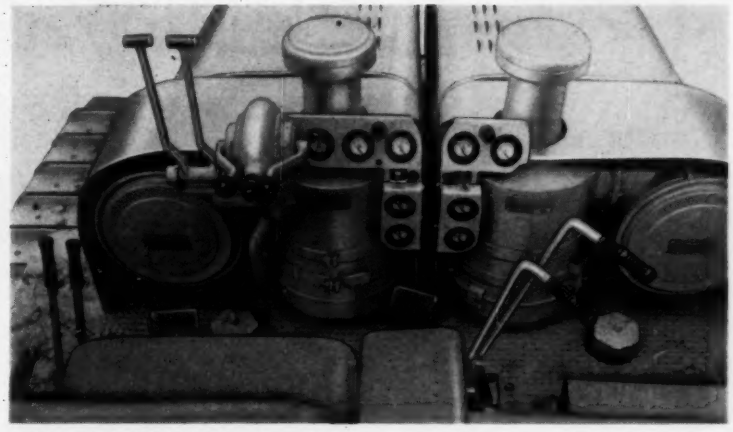
THE PATENT SCAFFOLDING CO., Inc.

38-21 12th Street, Dept. CM-E, Long Island City 1, N. Y.

1550 Dayton Street, Chicago 22, Illinois • West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.

In Canada: 355 Dufferin St., Toronto • Branches in all Principal Cities

Dry-Type Air Cleaners Improved



COMPACT CLEANERS—Dry-type Donaldson air cleaners are now standard on Euclid's TC-12 tractor. The cleaners, which replace four oil bath units, are 99.9% efficient.

SPARKED by recent design improvements, dry-type air cleaners are coming into their own.

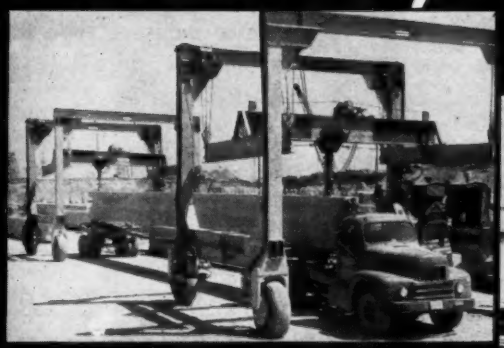
The latest piece of heavy equipment to be offered with dry air cleaners is Euclid's twin-engined TC-12 crawler tractor. Current production models now are equipped with two dry-type Donaldson air cleaners instead of four oil bath cleaners. When properly serviced, the new cleaners are 99.9% effective, according to Euclid. In addition, they are more compact than oil-bath cleaners and easier to service.

Another way that dry air cleaners are being used is demonstrated by the Gaskill Construction Co. This contractor has had excellent results since teaming dry and oil bath cleaners on earthmoving equipment working on a dusty New Jersey road job. Gaskill reports it has doubled the period between engine overhauls and cut servicing time considerably since installing Fram dry

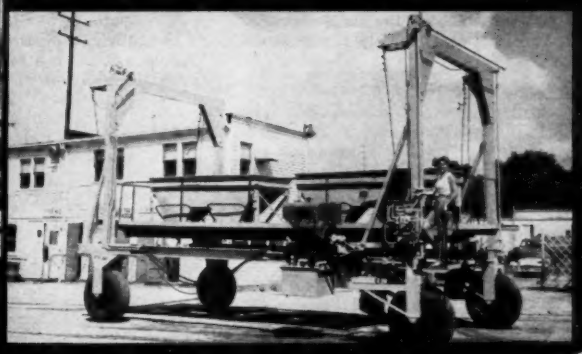
continued on page 210

Travelift*

A new concept in materials handling problems used by most prestressed plants in the Midwest.



Travelift offers the fastest, safest method of loading girders.



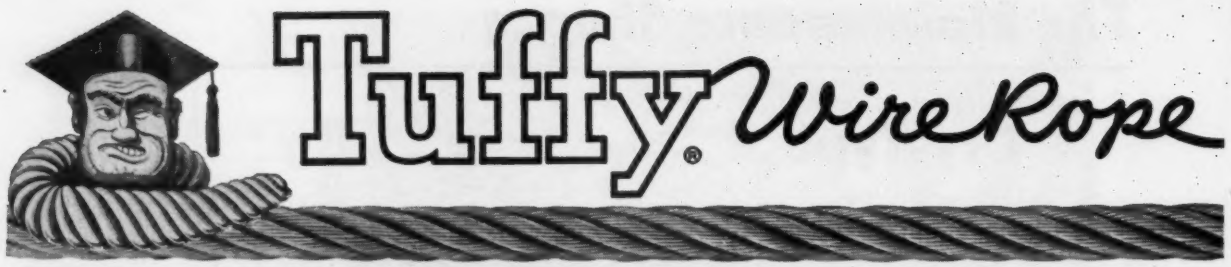
Travelift can be custom built to meet your existing plant requirements.

* Equip your plant with the most modern and versatile equipment available. Use Travelift to pull strand, set forms, pour forms, clear beds and store finished product.

For complete information, write to Travelift & Engineering, Inc. Sturgeon Bay, Wisconsin.

Name .....

Address ..... City ..... State



"Preventative Maintenance" Will Give You Longer Wire Rope Service

Every motorist knows the importance of proper lubrication for cars. It's essential for wire rope, too. For wire rope is a "machine" of precision moving parts. And friction is enemy No. 1 of all machinery.

Lubrication during fabrication

There are two distinct phases of lubrication: in manufacture, and in use. Wire rope engineers consider the lubricant as part of the rope; the kind, consistency and amount of lubricants are controlled and applied as required. Applications are usually made hot for the inside and external surfaces.

Lubrication in the field

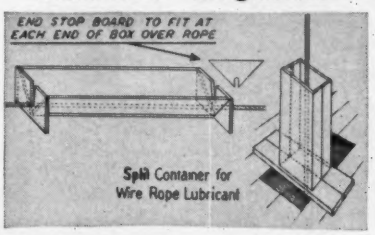
Here only an external application of lubricants is possible. It must penetrate to the inside of the rope to get a film of oil between the strands and the core. The lubricant can be applied either hot or cold, depending on its penetrating quality.

To find the best lubricant for your wire rope, talk to a local oil company engineer. He'll recommend the oil and method of application best suited to your needs.

How much and how often?

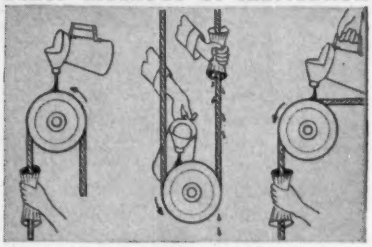
There's no set rule. It depends on service conditions. The heavier the duty, or the greater the number of bends, or the more corrosive the fluids in which the rope operates, the more frequent should be the lubrication. Remember one thing. The core is not an oil reservoir for external lubrication of the rope. No such action takes place. The oils "built" into the fiber core during its fabrication are to preserve and lubricate the vegetable fibers, not the external steel wires.

Two Types of "home-made" oiling devices



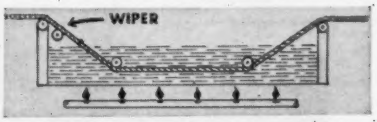
They're simple and do a good job. One is for vertical ropes, the other for horizontal. A heavy crankcase oil, cylinder oil or similar lubricant, preferably heated, is placed in the lubricators when the rope is run through.

Other Methods of lubrication



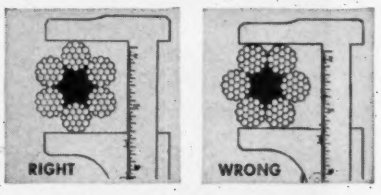
The pour-on method for manual lubrication is effective when penetrating, yet adhesive, oil is used. Oil should be hot. Hold the wiping swab BEHIND the sheave. This catches any excess oil that would be carried on along the rope.

Metal split box for bath treatment has a burlap collar or wiper at outlet end.



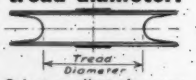
Hot bath method of applying heavier-bodied lubricant at high temperature. Gas burners or steam heat may be used. Pre-heated lubrication is always more penetrating. Rope should run through slowly to insure penetration.

How to measure rope diameter:



Use a machinist's caliper. Be sure to measure the widest diameter.

How to measure tread diameter:



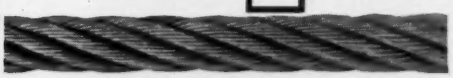
Select smallest sheave or drum to be used with new rope, and measure actual diameter of tread.

Sheaves with grooves corrugated with rope lay impression should be replaced with new ones before installing new wire rope.

New ropes are usually over-size. It is advisable to have groove diameters of sheaves or drums as large as the actual calipered diameter of the new rope, or slightly larger. We recommend sizes as follows:

58-4

Tips



Too much strength can be a weakness... Wire rope must be BALANCED

Recommended sizes:

Diameter of Rope	Minimum Dia.	Maximum Dia.
1/4-5/16	+ 1/64"	+ 1/32"
3/8-3/4	+ 1/32"	+ 1/16"
7/8-11/8	+ 3/64"	+ 3/32"
11/4-11/2	+ 1/16"	+ 1/8"
15/8-21/4	+ 3/32"	+ 3/16"
23/8 and larger	+ 1/8"	+ 1/4"

How to check groove diameter:

Sometimes extra strength is heavily stressed in selling wire rope. While strength is important in every operation where wire rope is used, it is not the only important quality, and there are cases where excessive strength is a liability.

For example, the manufacturers of scrapers have designed the components of their equipment to take certain loads. These loads are controlled by or subject to the ultimate strength of the rope. Larger ropes with their accompanying higher strength do not break but *the equipment itself begins to* break up. Another feature of scraper rope is resistance to crushing. Strength is not the factor which controls the best design to resist crushing.

Union Wire Rope gives you the PROPER BALANCE of strength, toughness, flexibility and other properties most desirable for rope efficiency and long life. Don't settle for less. Your Union Wire Rope distributor has the BALANCED rope for every use.

Special Purpose Ropes: tailored & BALANCED for special uses

Tuffy BALANCED Slings & Hoist Lines

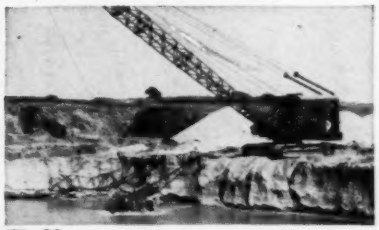
Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.

Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.

Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!



Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

Ordering is ABC-Simple!

No complicated codes or long list of specifications. Just say "Tuffy," give type (Scraper Rope, Dozer Rope, etc.), length wanted and size. Just that easy!

Good Man to Know — Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready with "right-now" service. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

union Wire Rope corp.

SUBSIDIARY UNITED STATES STEEL CORPORATION

2270 Manchester Ave. Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

filters in series with oil bath cleaners.

Gaskill mounted the dry filters on job-made brackets directly on top of the original oil bath cleaners on a fleet of Caterpillar scrapers. Since the filters have been functioning as pre-cleaners the oil bath cleaners need little service. They get only an occasional inspection when the dry filters are changed. It takes only about 15 min to remove, clean, and replace a dry filter element. If a new or reconditioned cartridge is on hand, it can be substituted for a dirty one in about 2 min.

Air Capacity Doubles

In the past 10 yr, manufacturers and contractors have been forced to improve the devices that filter the huge quantities of air that high-speed engines require. The introduction of the supercharger and later the turbocharger has doubled the amount of air a diesel engine consumes. And dirty intake air has always been the diesel's number one killer.

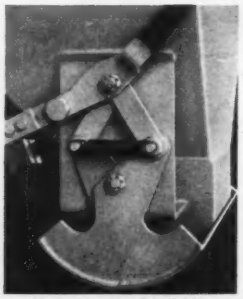
At the same time that the need for clean air becomes critical, equipment designers are faced with the problem of making filtering devices compact and easier to service. As air cleaners grow in size to accommodate larger quantities of air, the problem of where to install them becomes a serious one. And no cleaner can function properly if it is not serviced regularly and properly.

Present day dry cleaners provide answers to both of these problems. Not only are dry cleaners more compact than oil bath cleaners, but they can be installed vertically as well as horizontally when necessary. Because they have no oil, their angle of operation has no effect on their efficiency.

Besides being easier to service, dry air cleaners have other important advantages. There is no oil to be drawn over into the engine as the cup fills with dirt. Also, dry cleaners maintain a high level of efficiency throughout the

PRE-CLEANER—Contractor cut down on engine overhauls when he installed Fram dry filters in series with oil bath cleaners.

watson metco EQUIPMENT HELPS YOU BID COMPETITIVELY



U. S. Pat. No. 2,785,840

1 HOPPER GATE
The exclusive and patented double clam shell gate is used on all Cmetco hoppers and buckets. Fast opening, positive closing action prevents waste of material ... special design gives maximum strength and minimum weight.

2 POWER BUGGY
Cmetco Power Buggy provides fast and heavy-duty concrete handling. No operator training required and simple, efficient design means easy maintenance. Travels 17 mph and shifts from forward to reverse in an instant.

3 TELESCOPING SCREED
Cmetco Telescoping Vibratory Screed reduces manhour costs and gives you better depth compaction. Ideal for highway, bridge, slab and floor work. Exclusive construction eliminates space restrictions and need for auxiliary beams.

WRITE FOR COMPLETE INFORMATION

MANUFACTURED BY CREATIVE METALS CORP. exclusively for H. S. WATSON COMPANY
1316 - 67th Street
EMERYVILLE, CALIFORNIA
TOLEDO, OHIO

watson metco

ROLA PAVERS • WOOD AND STEEL TILT-UP HARDWARE • BULL FLOATS • HOPPERS • BUCKETS ELEPHANT TRUNKS AND CHUTES • TAMPERS HAND CARTS • POWER BUGGIES • TELESCOPING AND ECONOMY VIBRATORY SCREEDS

WC-9

BETTER EQUIPMENT FOR PLACING AND FINISHING CONCRETE

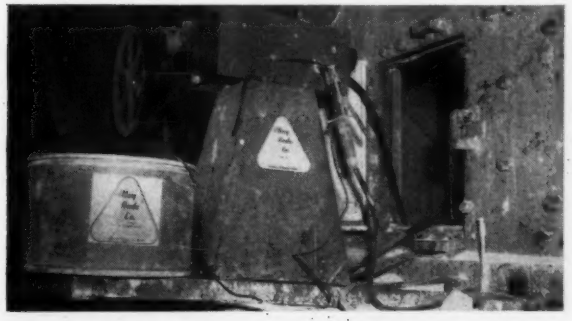
How semi-automatic hard surfacing saves time and material at Bradford Hills Quarry

"Changing to the semi-automatic application of nickel manganese surfacing material almost saved us the price of the Wear-O-Matic machine in just five weeks," says Thomas Risbon, Welding Foreman for Bradford Hills Quarry, East Petersburg, and Downingtown, Pa.

The Wear-O-Matic unit at Bradford Hills Quarry is used almost exclusively for maintaining their new 57-60 Universal Impactor. Over a five week period, nightly maintenance on this crusher required 500 pounds of 7/64" Wear-O-Matic nickel manganese wire to provide normal operating tolerances.

During a similar period, 800 pounds of ¼" nickel manganese stick electrodes were required to provide the same amount of wear protection to the impactors.

Savings in maintenance operations in your industry are important because they affect profits. Find out how the Wear-O-Matic process can help lighten your maintenance load. It's built right and priced right* to provide for you the most efficient maintenance on all equipment subject to wear. Request Bulletin HS-122 Alloy Rods Company, P. O. Box 1828, York, Pennsylvania.



From this platform on the crusher, the Wear-O-Matic unit is used nightly to maintain proper impactor size for most efficient operation.

Weldor Gene Johnson says, "It's easy to turn out square edged impactors like this with the Wear-O-Matic process and, it's less tiring than stick electrodes."

* Price f.o.b. York, Penna. $279.00.

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ALLIS-CHALMERS

Koehring Model 205 ½-yd shovel with Allis-Chalmers 273 engine loading copper ore at Tejano Mining Company in New Mexico.

BC-17A

entire air flow range. One reason for this is that there is no slowdown of air to permit oil to recirculate.

The major criticism of earlier dry air cleaners was that the paper element that many of them used as the primary filter was ruined quickly by carbon from the engine exhaust, oil vapor, or moisture. And when they needed servicing, the filter element generally was thrown away.

Dry Cleaners Get Better

Recent design advances have eliminated these failings in most cases. On the better dry-type cleaners the paper filtering element has been strengthened and redesigned and it comes into play only in the second or third cleaning stage.

The Donaldson cleaner that has become standard on the Euclid TC-12 tractor is typical of the recent progress in dry air cleaner design.

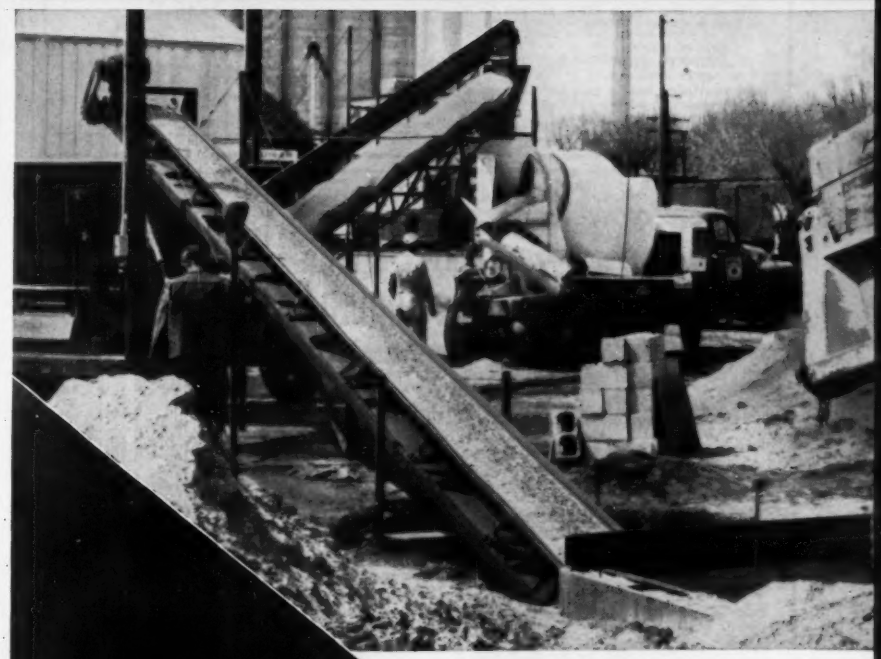
This cleaner uses the cyclone principle as its primary filter. The cleaner draws dirty air into a chamber where it is rotated by a helix vane to create a centrifugal force on dust particles. The air spirals down the tube section of the cleaner and reverses itself at the bottom. As the air reverses itself, dirt is ejected to the dust cup. The clean air then moves through the cyclone outlet into the paper element for final filtration before entering the engine.

The paper element on cleaners of this type does no work until air has been pre-cleaned. Because the paper element is not the primary cleaner, its life is extended to the point where it needs less frequent servicing than does the average oil bath cleaner. There is no oil cup to clean and change; the dust cap is emptied easily, and the filter element is blown out or changed when necessary.

It costs more to service a dry cleaner because the filter element is generally a replaceable cartridge. Newer cartridges can be reconditioned and used over several times. Usually they are cleaned by a compressed air flow. The rule, however, must be that when in doubt throw it out. The damage that a faulty filter can do to an engine makes the use of questionable elements the worst kind of false economy.

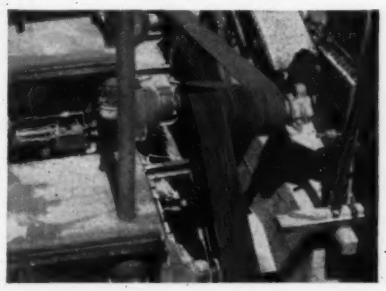
Thermoid Belting is "built to take it"

at the rate of 175 tons an hour



The McShane "BATCH-A-MATIC" is equipped with Thermoid Conveyor Belting.

Cut costs with Thermoid Multi-V Belts . . .



. . . and Thermoid Hose

The belting used on the McShane "BATCH-A-MATIC" takes severe abrasion and hard use. In the space of two minutes, it has to charge a truck with 3 cubic feet of aggregate, *plus* 21 cubic feet of cement . . . or stockpile aggregate at 175 tons an hour.

T. S. McShane Co., Omaha, makers of the "BATCH-A-MATIC" equips every machine with Thermoid Belting. To quote Mr. R. Milek, McShane's chief engineer: "Thermoid engineers recommended this belting after studying our needs. This assures every customer long, trouble-free belt life without costly downtime."

Your distributor working with Thermoid engineers can recommend the right belt for *your* needs.

Thermoid

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Now available in a *new edition*... with *new figures.*

This popular booklet points up the important sales problem of personnel turnover in industry. Out of every 1,000 key men (over a 12-month period) 343 new faces appear . . . 65 change titles . . . 157 shift . . . and 435 stay put. These figures are based on average mailing address changes on a list of over a million paid subscribers to McGraw-Hill magazines.

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Boston 16: 350 Park Square Bldg.

Methods Memo . . .

Silver Dollars Buy Safety

Contractor Williams & Burrows of Belmont, Calif., pays a silver "safety dollar" to every man on a job where there's no lost-time accident for a month.

The idea has produced exceptionally good results, officials of the firm say. Accident frequency this year is about 40% below the level of 1957.

"We find the men policing each other," said A. C. Gorman, insurance manager. "Time and again we'll hear one worker catching another up on some carelessness that might cause an accident with a crack about 'that silver dollar.' "

The general superintendent on each job passes out the silver dollars on the first payday after an accident-free month. The program takes in supervisors. Each foreman gets three silver dollars; superintendents get five.

Williams & Burrows estimates the program costs about $5,000 annually because so many of the work force averaging about 400 men get the monthly award.

But the contractor figures these silver dollars are largely responsible for a much more substantial saving. B&W's workmen's compensation premiums this year are 25% less than last year.

Canadian Experiment

"Excellent results," says the Alberta, Canada, Department of Highways about the first trial of a new seal coat method on a 1,000-ft section of highway.

The new method produced a firm set approximately two hours after application instead of the two to four days usually required, according to Highways Minister Gordon Taylor.

A report on the experiment, issued by the Highways Minister, described the process this way:

"An application of 150/200 penetration asphalt—instead of the emulsified asphalt used on the balance of the project—was sprayed at a temperature of approximately 275 deg and at a rate of 0.20 gal per sq yd.

"Then chips were spread at a rate of 135 cu yd per mile, and heat applied by means of a bank of burners spaced at about 6-in. centers on a head bar 8 ft long. Rolling followed immediately behind the heater.

"The object was to see if the time of hardening could be reduced so that traffic could use the finished surface a short time after application. The heating was to draw the asphalt up on the chips to hold them in place. Use of penetration asphalt provided a quick setting material.

"Results appear to be excellent. A firm set has been obtained with practically no whip-off, and traffic could use the finished surface approximately two hours after application.

"If an additional experiment verifies the findings of the first, this could revolutionize our seal coating methods."

New Twist in Truck Driving

The operator of this truck-mounted crane can lead the rig along, turning it in either direction, without ever climbing into the cab. And he can control both the truck and the crane from within the crane's cab.

The remote control panel the operator holds in the picture makes this possible. Usually, it is mounted in brackets in the cab of the crane. But it can be detached from its mount and carried outside to spot the rig precisely in the desired position.

By pushing buttons on the control panel, the operator can start and stop the truck engine, actuate the power steering unit of the truck to turn it right or left, and operate the clutch to move the truck forward or in reverse.

Two employees of the Portland General Electric Co. of Portland, Ore., designed the device. Installed in a hydraulic crane, mounted on an International truck, it was used in construction of PGE's Mt. Angel substation. Its designers are L. F. Rohan, PGE garage superintendent, and John Parker, a mechanic.

The Bucyrus-Erie crane also is equipped with a radio receiver so the foreman can give the operator instructions over a "walkie-talkie" transmitter.

Training Mechanics Fast

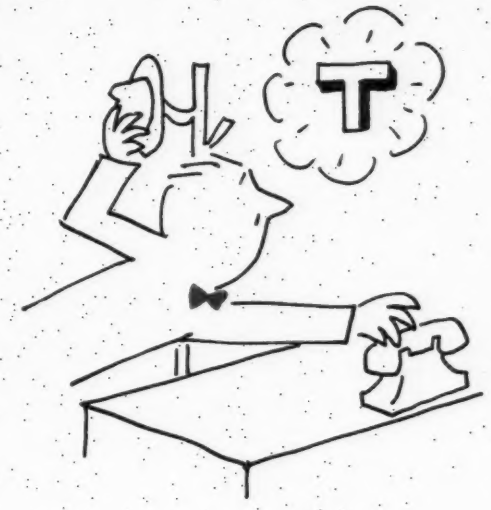
A school to train construction equipment mechanics has opened its doors to its first class at Wilmington, Ill., about 60 miles from Chicago.

Edwin Greer, president of Greer Technical Institute, says he believes it is the first school of its type in the U.S. Greer Technical Institute also trains heavy equipment operators at a school in Braidwood, Ill., four miles from the new school.

The mechanics school is an intensive 10-weeks course. It will run 10 hours a day, 5½ days a week and will include 60 hours of instruction in each of these fields: diesel engines, fuel injection systems, torque converters, final drives, steering systems, tractor tracks, cable controls, welding, and bulldozer rebuliding. The course costs approximately $300.

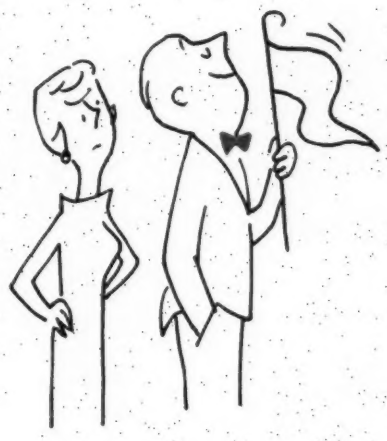
1.

A vast and costly stadium was voted by the town,
Among the last to hear the news was able builder Brown.
He had returned that morning from a project out of state.
He groaned as he prepared his bid, "I hope I'm not too late!"



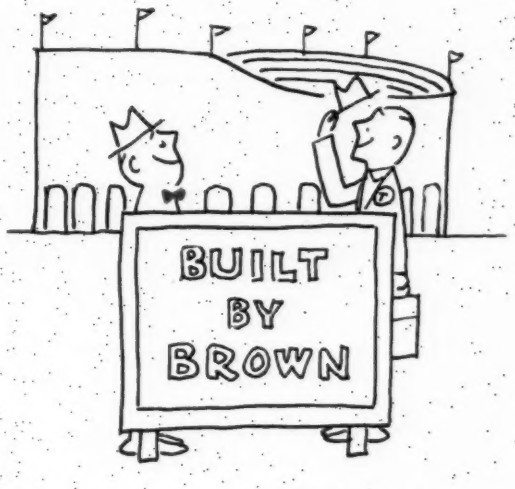
2.

He rushed to call his Travelers man, "Can you come out tonight?
That ball park bid! I need a bond. It must be *fast* and *right*."
The Travelers man replied, "Why, sure! Be at your house at eight!"
So Brown went home to wife and kids delighted with his fate.



3.

"How can you be so confident?" his wife asked with a frown.
"Because I trust my Travelers man," said happy Mister Brown.
"He's expert with those local laws that slow the bond you need.
He knows that time is money, so a bond arrives with *speed*."



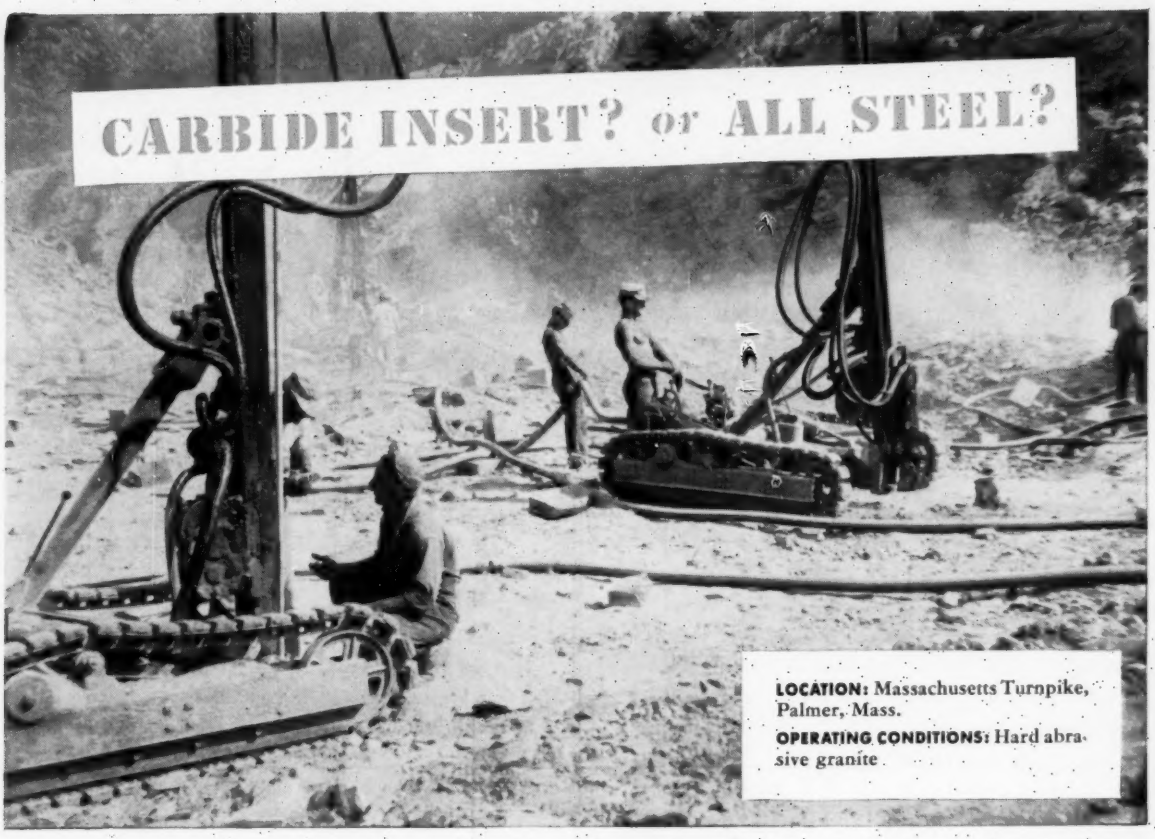
4.

And right as rain and on the dot, Brown had his bond in hand.
Behind a signboard "Built by Brown" the stadium looks grand!
For fast and friendly service, think of Travelers when you plan.
A Travelers bond is always right. So call your Travelers man!

NOTE: *Comp. Equipment Floaters—Builders' Risk Insurance, too*
Are other ways The Travelers helps a contractor like you.

THE TRAVELERS
Insurance Companies
HARTFORD 15, CONNECTICUT

All forms of business and personal insurance including Life • Accident • Group • Fire • Marine • Automobile • Casualty • Bonds


CARBIDE INSERT? or ALL STEEL?
LOCATION: Massachusetts Turnpike, Palmer, Mass.
OPERATING CONDITIONS: Hard abrasive granite

Grandview Construction Corporation sped deep hole drilling on Mass. Turnpike with Timken® carbide insert bits

GRANDVIEW Construction Corporation had to drill extremely deep holes through hard abrasive granite on its sections of the 123-mile Massachusetts Turnpike. To get speediest drilling at the most economical cost, Grandview used Timken® carbide insert bits. They got maximum production, kept bit cost per foot-of-hole at rock bottom.

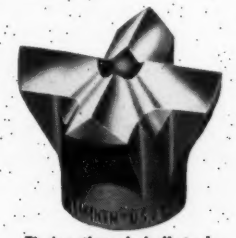
For economical drilling in hard, abrasive ground, Timken carbide insert bits are your best bet. But carbide bits may not be the best choice for *every* job.

In ordinary ground, you get more economical results with Timken all steel multi-use bits. Correctly controlled and reconditioned, they give you lowest cost per foot-of-hole when you can drill out full increments of drill steel.

With Timken carbide insert and all steel multi-use bits, your drillers save time. Dozens of different bits fit the *same* drill steel, let you switch bits fast as the ground changes. And both types of bits have a special shoulder union that protects threads against drilling impact.

Timken rock bits are made from electric furnace Timken fine alloy steel. We're America's only rock bit manufacturer that makes its own steel.

For expert help on selecting the best bit type for your drilling jobs, write The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".



Timken threaded all steel multi-use rock bit

Timken threaded carbide insert rock bit

your best bet for the best bit ... for <u>every</u> job

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